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ABSTRACT

This report on Phase I, of a four-phase study, of the California Educational Technology Assessment Program (CETAP) provides a descriptive analysis of 14 programs and projects funded by the Educational Technology Local Assistance Program, Assembly Bill 803 (Chapter 1133, Statutes of 1983), between 1984 and 1989. The information reported is intended to: make the reader aware of valuable resources and programs previously initiated and inform decision makers about past practices that should be considered in the design of new technology programs and initiatives. Following an overview of the program, this report addresses 14 topics in separate sections: (1) Technology in the Curriculum Guides; (2) Technology in the Curriculum Software (3) Summer Technology Training Institutes; (4) California Video Clearinghouse; (5) California Software Clearinghouse; (6) Teaching Videotape Pilot Program; (7) California Historical Society "On Location" Programs; (8) VCR (Videocassette Recorder) Distribution Program; (9) ITV (Instructional Television) License/Program Acquisition; (10) ETN (Educational Telecommunications Network) Staff Development Project; (11) California Mechanical Universe Model; (12) Developmental Projects; (13) Dissemination Projects; and (14) Adoption/Expansion Projects. A list of nine recommendations concludes the report. Appendices contain a report on telephone interviews with participants in Summer Technology Institutes and a list of 72 selected references. (AEF)

Far West
LABORATORY

Study of Educational Technology Programs Authorized from 1984-1989

Phase I of the Comprehensive Study of Educational Technology Programs Authorized from 1984-1992

December 20, 1991

Submitted to:

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Office of Educational Technology
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Sacramento, CA 95814

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Study of Educational Technology Programs Authorized from 1984-1989

Phase I of the Comprehensive Study of
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Authorized from 1984-1992

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Contents

Overview

Phase I of the California Educational Technology Assessment Program (CETAP) provides a descriptive analysis of 14 programs and projects funded by the Educational Technology Local Assistance Program, Assembly Bill 803 (Chapter 1133, Statutes of 1983), between 1984 and 1989. The information reported serves to: 1) make the reader aware of valuable resources and programs previously initiated and, 2) inform decisionmakers about past practices that should be considered in the design of new technology programs and initiatives.

Background

Assembly Bill 803 greatly expanded previous educational technology legislation. The act was signed into law on September 27, 1984, with a sunset review required by June 30, 1989. The provisions of AB 803 were extended until the current legislation, Assembly Bill 1470, the Farr-Morgan-Quackenbush Educational Technology Act of 1989, was signed into law.

In fiscal year 1984-85, AB 803 programs received $15 million in legislative appropriations. Funding for 1985 and 1986 increased to $26 million. In 1987 the budget was cut back to $13 million. During the life of AB 803, the Legislature provided over $60 million for school-based adoption/expansion grants awarded competitively to schools across the state. A wide variety of school level projects for classroom applications of technologies, including computers, instructional television (ITV), telecommunications, interactive video, and others were funded. The first adoption/expansion grants tended to fund equipment acquisition with minimal emphasis on teacher planning, program coordination, curriculum, and staff development. For this reason, the Educational Technology Committee recommended that staff development be incorporated in the projects. This resulted in increased attention to staff development and integration of technology into instructional programs to meet the new educational technology program requirements.

A portion of AB 803 funding was used to augment the efforts of the network of regional Teacher Education and Computer Centers (TECCs) in supporting the development and implementation of the adoption/expansion grant projects. AB 803 continued the state-wide network of seven regional ITV agencies, and more recently, initiated the California Technology Project (CTP) with resource consortia in 14 regions. AB 803 also funded several curriculum materials development and acquisition programs, including the Technology in Curriculum (TIC) projects, Computer Software and Instructional Video Clearinghouses, software development projects, VCR distribution, Summer Technology Training Institutes, the Model Technology Schools projects (MTS Level I), Developmental and Dissemination Projects, a Teaching Videotape Pilot Project, the Academic Model Technology Projects (MTS Level II), and several unsolicited projects.

The AB 803 programs were authorized at different times and for a variety of reasons. Most of the decisions for funding programs were based on input and recommendations from the Educational Technology Committee, the CDE, and from other educational agencies. Some projects were in response to "unsolicited" proposals and others were developed as a result of requests for proposals (RFP) or applications (RFA) distributed by the CDE. A state educational technology plan that would guide program decisions was developed in 1987 by the CDE with advice from the Educational Technology Committee. By the time the plan was developed, the Governor cut the budget to the extent that it was not possible to implement the plan.

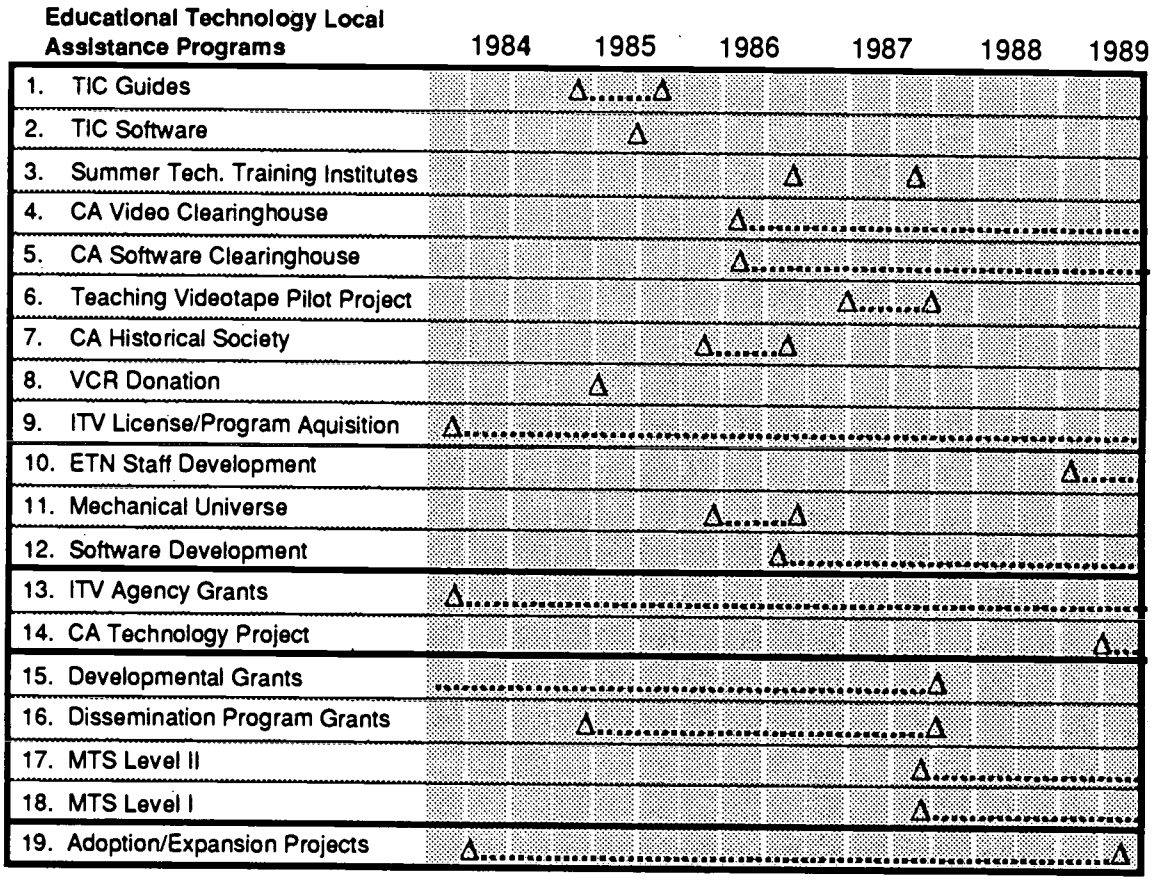
In August of 1988, the Office of the Legislative Analyst issued a report, *Educational Technology Local Assistance Program: Sunset Review,* which concluded that the value and educational benefits of the array of AB 803 programs had not been sufficiently evaluated. The

report noted that there were "no state-level data to determine the impact of the Educational Technology Program in terms of educational outcomes" (p. 5) and recommended that the Legislature require (1) that all recipients of Educational Technology Programs funds complete program evaluations based on educational outcomes, using models developed by the CDE, and (2) that the CDE use these evaluation results in identifying cost-effective uses of educational technology (p. 24).

Programs Established from 1984-1989

This Phase I report provides a descriptive analysis of 14 of the 19 programs funded by AB 803 from 1984 to 1989. The five programs initiated under AB 803 which were re-authorized by AB 1470, are not described in this phase of the study as they are later described, in depth, in Phase II of this study. These five programs are the Level I and II Model Technology Schools, ITV Agencies, CTP and its consortia, and the software development projects. Figure 2 below shows the time frame for the implementation of all 19 programs authorized by AB 803.

Figure 2: Major Programs Funded by AB 803 from 1984-1989



Program Descriptions and Data Sources

Program Description Format: The CETAP staff gathered available information and completed the Phase I program descriptions. The information, pertinent to each project or program, was aggregated, analyzed, and generally reported according to the following categories:

I. Background Information
II. Planning and Restructuring
III. Program/Project Content
  a. Curriculum
  b. Staff Development
  c. Learning Resources Management
  d. Dissemination
  e. Evaluation
IV. Program Implementation
V. Support Funding and Resources and Constraints
VI. Outcomes
VII. Current Status
VIII. Recommendations

Phase I Data Sources: When appropriate and possible, sections were reviewed and edited by educators who had close involvement with the programs being described. It is recognized that these reports may not include particular facts and that some of the information may not be as extensive as desired. Data sources for producing the reports were, at times, conflicting or lacking in depth. Figure 3, below, matches major data sources with each of the 19 educational technology programs described in this report.

Figure 3: AB 803 Projects and Major Sources of Data for Phase I of the Evaluation Study

Programs and Projects Studied	Data Sources: CDE records and reports	Project proposals and plans	Project evaluation reports	ITV agency records	Ed. Tech Committee Reports	AB 803 Sunset Report	Existing policy studies	Existing research reports	Previous Survey Data	Telephone surveys	Interview of agency/project staff
1. TIC Guides	√							√	√		
2. TIC Software	√								√		
3. Summer Tech. Training Institutes	√		√		√				√	√	
4. CA Video Clearinghouse	√	√			√	√					√
5. CA Software Clearinghouse	√	√			√	√					√
6. Teacher Training Video Project	√										
7. CA Historical Society	√		√	√	√						
8. VCR Donation	√			√	√	√					
9. ITV License/Program Aquisition	√			√	√	√					
10. ETN Staff Development	√				√						
11. Mechanical Universe	√				√						
12. Developmental Grants	√	√	√		√	√					
13. Dissemination Program Grants	√	√	√		√	√					
14. Adoption/Expansion Projects	√	√	√		√	√	√	√	√		

The director of CETAP has attained much of the information through involvement in many of the programs at district and county office levels and by assisting the CDE in implementing others since 1983. Published and unpublished reports provided primary data for several components of the program, including: (1) a study on the level of use and impact of the TIC Resource Guides; (2) evaluation reports on several of the developmental and dissemination projects (3) an analysis of AB 803 Adoption/Expansion Projects in San Mateo County; (6) Policy Report for Program Improvement with Educational Technology in California Schools for PACE; and (7) a variety of unpublished documents on the development of AB 1470.

The following pages of this document provide a detailed descriptive analysis of the 14 programs and projects reviewed in Phase I of the study.

Technology In the Curriculum (TIC) Resource Guides

I. Background

Program Summary. During fiscal year 1984-85, the CDE initiated the Technology in the Curriculum (TIC) Projects to match computer software and video programming with the curriculum, to identify curriculum areas where acceptable programs were not available, and to develop and distribute resource guides describing the available programs. Eligible applicants, in response to a request for proposals (RFP), were to develop plans to analyze the California Curriculum Frameworks and Model Curriculum Standards, review existing computer software and instructional television (ITV) series, and to identify high-quality programming that matched the curriculum on a topic-by-topic basis (CDE, 1984b).

Governance. Four TIC projects were funded in 1985-86; the projects and their host and partner agencies (if any) were as follows:

Subject Area	Fiscal Agent and Partner Agencies
Language Arts	Santa Clara County Office of Education, KTEH/TV, Teacher Education and Computer Center, Region 8 (TECC 8)
History-Social Science	Far West Laboratory for Educational Research and Development, South San Francisco Unified School District, KQED-TV, Alameda County Office of Education
Mathematics	Lawrence Hall of Science, University of California, Berkeley
Science	Lawrence Hall of Science, University of California, Berkeley

Each of these projects produced an array of resource materials, including Resource Guides that served as "consumer guides" for selecting programming, and were distributed to over 7,300 public schools and technology resource centers in California. They also conducted workshops to familiarize staff of the Teacher Education and Computer Centers (TECCs) and county offices of education with the TIC materials. In addition, the TIC subject matter projects provided staff and resources to help develop and conduct summer technology institutes at institutions of higher education around the state (see Section on Summer Technology Institutes for more information).

Two additional projects were funded in 1986-87; these were:

Subject Area	Fiscal Agent and Partner Agencies
Fine Arts	Los Angeles County Office of Education
Foreign Language	Stanislaus County Office of Education

The resource materials prepared by these two projects were distributed to California schools and other technology resource centers through the California Software Clearinghouse, then located at the San Mateo County Office of Education.

Legislative Authority and State Guidelines. Assembly Bill 803 authorized the CDE to address five major initiatives in support of other state-wide reform efforts in curriculum and instruction. The TIC Project, administered by the Office of Educational Technology, with the advice of the Educational Technology Committee, addressed the AB 803 Curriculum Materials Development and Acquisition initiative. In support of this initiative, the CDE established three separate grant programs, including the TIC Projects, which in turn led to several new projects to extend the impact of the basic program. The idea for the TIC projects had evolved from several other AB 803 programs that matched software with the school curriculum such as the CompuTHINK and SciTEC developmental and dissemination projects.

II. Program Planning

Program Tasks. As competitive grant recipients, all of the TIC projects were required to develop comprehensive plans addressing the goals and objectives set forth in the RFP (CDE, 1984b). In their grant applications, the prospective directors of each of the TIC projects were to carefully plan and propose how four major tasks would be accomplished. These tasks included: preparation of a concept paper to define the context for the effective use of technology, identification of exemplary software and video programs and development of a resource guide and diskette, acquisition of exemplary programs for state-wide use, and identification of technology applications needed to fully support the curriculum.

Needs Assessment. The RFP for the TIC Projects had been prepared in response to a set of recommendations from the Educational Technology Committee about the need of teachers for guidance in selecting effective technology based materials. To a great extent the TIC projects also relied upon advice from the Educational Technology Committee and separate advisory panels that were established by each TIC project. The need for a technology consumer guide was also expressed by recipients of AB 803 grants at schools sites. These groups provided expert guidance in subject matter curriculum and instruction and current and emerging uses of educational technologies in each field. They identified the needs of teachers and school administrators for information, instructional and resource materials, and staff development.

III. Program Description

Program Purpose. The primary purpose of the TIC Projects was to organize information about computer and video programs for ready access by teachers so that these programs could serve as tools to augment curriculum and instruction. Each of the six projects was to:

- Determine which elements of the curriculum could be best taught with technology
- Identify high-quality technology programs available to support the frameworks
- Design model lesson and unit plans that demonstrate to teachers how to incorporate technology into the curriculum

The TIC resource materials were intended to help teachers more effectively address the learning objectives set forth in the California curriculum frameworks.

The TIC projects established procedures to identify computer software and ITV programming that met several criteria. Evaluation teams of three teachers worked to identify technology programs that :

a. Were appropriate for various school audiences, different grade levels, educationally handicapped, gifted, and so forth.

b. Met minimum standards for technical and educational quality.

c. Provided supplementary materials that helped integrate technology into the instructional program, such as teacher's guides, lesson plans, curriculum extensions, and the like.

d. Suggested potential uses that extend instruction beyond what teachers already provide.

e. Were use user friendly and require minimal training.

f. Made use of equipment commonly available to schools.

g. Were current, reasonable in cost, and readily obtainable.

h. Matched, supported, reinforced, extended, and/or enriched the specific curriculum topics for each framework subject.

Areas of Emphasis. The TIC projects addressed the following areas of emphasis determined by the CDE:

1. ***Curriculum.*** Each TIC project staff carefully reviewed and then operationally defined the state curriculum frameworks. The framework information was then used to guide the analysis of each software and video program that first met the minimum criteria for quality and appropriateness described above.

2. ***Staff Development.*** The RFP for the TIC Projects did not require applicants to propose staff development or dissemination support activities. The first four TIC projects, however, developed rather extensive staff development components. They collaborated with CDE consultants on TIC dissemination workshops for staff of the TEC Centers and selected county offices of education. At three regional workshops the TIC projects helped the TECCs plan local staff development workshops for school personnel who were to receive the TIC resource materials.

   The four TIC projects also collaborated in the production of a fifteen minute video tape to introduce the TIC resource materials in conjunction with the TIC staff development programs. In addition, the TIC projects provided staff to help plan and conduct teacher institutes at several California universities in the summers of 1986 and 1987. (See also the sections in this report on TIC Software Distribution and Summer Technology Training Institutes.)

3. ***Learning Resources Management.*** The TIC resource materials were intended to serve as tools to help educators integrate technology materials with conventional instructional resources. One TIC product, the *DataRelator*, was designed specifically to help teachers make more efficient use of the TIC materials in planning instruction. *DataRelator* was a public domain relational database program that enabled teachers to search for software and ITV programs that support specific instructional objectives. Teachers could also modify the *DataRelator* program by adding or deleting information on technology materials.

4. ***Dissemination.*** The TIC RFP did not require projects to plan for dissemination. However, in conducting the regional TIC training and assigning TIC project staff to the summer technology institutes, dissemination became a major and critical byproduct of the TIC Projects.

5. ***Evaluation.*** While the evaluation of technology programming was one of the main objectives of the TIC Projects, none of the TIC projects had a separate, formal evaluation component to assess its own outcomes. None of the TIC projects were known to have conducted follow-up evaluation of the effectiveness or impact of the TIC resource materials in school settings. If the TEC Centers had continued, perhaps such evaluations would have been possible.

IV. Program Implementation

TIC Project Collaboration. Because the TIC program awards were competitive, the agencies applying for the first set of four TIC grants prepared their proposals in isolation from one another. None of the applicants anticipated the high level of collaboration needed for implementation of the projects. Realizing the situation, the CDE hired a TIC coordinator to bring key staff of the projects together and to help the projects to coordinate development of the TIC resource materials. In addressing the original TIC objectives collaboratively, the four projects achieved completion of the following:

1. ***Concept paper.*** Each project independently prepared a position paper that defined the context for the effective use of technology to support and improve instruction. The papers were published as part of the resource guides.

2. ***Resource guide and resource diskette.*** Each project screened and evaluated computer software and ITV programming in its subject matter area and matched it to the curriculum framework topics. Each also produced a resource guide with a "curriculum match" matrix that correlated technology programs with specific instructional topics and objectives.

   The Office of Educational Technology and the four original projects collaborated in conceptualizing the *DataRelator*.

   The design artwork and printing of the resource guides was performed by a single publication design company for all four projects. Subcontracts for receiving, warehousing, and shipping all four sets of resource materials were managed by the Far West Laboratory. Final distribution of the TIC materials was accomplished by the TEC Centers and selected county offices of education.

3. ***State-wide acquisition of exemplary programs.*** The projects cooperated with the CDE to establish criteria for identifying a limited sample of exemplary software programs for acquisition by the CDE. They also helped in planning the distribution of the programs to California schools along with the TIC resource guides. (See separate report on the TIC Software Project.)

4. ***Identification of needed technology applications.*** After completing the evaluation of ITV and computer programming, each project identified the areas of the curriculum that were well supported by acceptable technology materials and which areas were not. Then each prepared a report to the CDE and made recommendations for initiatives to fill the "holes" in the curriculum. These reports were considered by the CDE in funding projects to develop software programs (see the separate section in this report on Software Development).

The second set of TIC projects, fine arts and foreign language, followed much the same set of general guidelines as had the first four. They were funded, however, at substantially lower levels and did not include extensive staff development or dissemination components.

V. Resources to Support Implementation

Support Factors. The TIC Projects were an important but temporary element in the CDE's state-wide educational reform efforts. If its resource materials were to have a significant impact on teaching and learning in the state, then the TIC products would have to be integrated into the

mission statements of agencies that could provide ongoing dissemination and staff development services. The organizational context for this support system was developed by the CDE and TIC Projects staff in several ways:

- TEC Centers and selected county offices of education provided TIC orientation workshops while delivering the TIC resource packages;
- Later, the TECCs were designated as TIC software resource centers, and they added the TIC resource materials to educational technology staff development programs;
- ITV Agencies identified programs evaluated by the TIC projects in their annual broadcast schedules and staff development programs;
- TIC project staff members acted as instructors at the Summer Technology Training Institutes at several universities in the summer of 1986;
- The CDE followed the recommendations of the TIC projects in negotiating state-wide licenses for ITV and computer programming; and
- The implementation of TIC resource materials was incorporated in the requirements for schools to receive AB 803 Adoption/Expansion Grants.

Adequacy of Resources. The facilities and support resources at each of the agencies that received TIC Project grants were sufficient for each one to carry out its proposed activities. The decision to collaborate in resource guide design and publication, warehousing, shipping, and distribution did involve some additional CDE resources beyond the amounts initially allocated to the projects.

VI. Program Funding Resources and Constraints

1. ***Project Budgets.*** Out of its 1984-85 fiscal year budget of $2,000,000 for the TIC Projects, the CDE awarded grants to the TIC subject matter projects as follows:

Santa Clara County Office of Education	Language Arts	$ 322,557
Far West Laboratory	History-social science	321,735
Lawrence Hall of Science	Mathematics	347,623
Lawrence Hall of Science	Science	349,623
Total		$ 1,341,538

In 1986-87 the TIC Projects budget of $500,000 supported the following:

Los Angeles County Office of Education	Fine Arts	$ 247,916
Stanislaus County Office of Education	Foreign Language	249,971
Total		$ 497,887

2. ***Cost Benefits.*** In the *Sunset Report for AB 803*, the Office of Educational Technology (CDE, c. 1987) provided the following summary of the TIC Projects:

> *To maximize the benefits of this major effort, each school in the state received a copy of each TIC Resource Guide, together with a sampling of the commercial software that is used in sample lesson plans appropriate to varying grade levels.*

3. ***Budget Equity.*** Equity was achieved through the distribution of TIC resources and training to all schools in the state.

4. ***Leveraging.*** There were two main areas in which the TIC Projects were able to extend the impact of their resources through "leveraging" activities. The first was in establishing the TIC staff development component to be operated by the TEC Centers. Second, the system for distributing the TIC resource packages through the TECCs and selected county offices of education was "piggy-backed" on already-well-established regional support services.

5. ***Budgeting Procedures.*** The arrangements necessary to support periodic updating of the TIC resource guides have required the CDE and the Educational Technology Committee to decide each year whether or not to provide ongoing support for the Software and Video Clearinghouses to conduct reviews and publish updates.

VII. Outcomes

Achievements. As mentioned earlier, the TIC Projects did not include a formal evaluation effort for assessing the impact of the separate subject matter projects, the staff development, nor the dissemination components. Some information on assessment of the impact of the TIC program by other agencies, though, is available from other sources. In the *Sunset Report, Assembly Bill 803*, the CDE reported several conclusions:

> *An unanticipated outcome of the TIC distribution appears to be the extent to which these materials will influence the nature of TECC training activities. As TECCs increase their focus on in-depth, long-term training in the teaching of subject content, the TIC materials will provide a rich resource.*
>
> *The Technology in the Curriculum materials have been enthusiastically received by teachers and others who are using technology to strengthen the curriculum. In order for the TIC Resource Guides to remain a valuable resource, however, the information in them must be updated on a regular basis. Each year hundreds of computer and video programs are released that have potential applications in the California curriculum. To review these newly released programs for quality and match to curriculum, $200,000 in Assembly Bill 803 funds have been allocated to each of two agencies. The San Mateo County Office of Education Software Library and Clearinghouse has had extensive experience in computer software evaluation and will provide, with assistance from the Curriculum Implementation Centers (CICs), quality reviews and curriculum match analyses in the subject areas of the first four TIC projects. The Stanislaus County Office of Education Media Center will provide a similar service for video materials. The two agencies will prepare jointly a TIC Update Guide, which will be distributed to all schools within the state in 1987.*

Software Development Projects Stimulated by TIC Findings. The TIC projects identified many areas where little or no quality software and video programs existed to support the California curriculum frameworks. The CDE with the advice of the Educational Technology Committee, then decided to issue grants to software developers to produce technology-based materials to fill these gaps with quality programs that would support and expand the curriculum. (See Software Development section)

Research on Impact of TIC. A survey of teachers and principals in San Mateo County conducted by the Director of the Teacher Education and Computer Center (TECC 17) in the Fall of 1986, attempted to determine the level of use of the TIC materials, the desired level and emphasis for future TIC training programs, and which software was receiving the most use. Albeit a limited sample to use in reaching state-wide conclusions, the data of the study reveal some interesting findings (Cradler, 1986):

1. The TEC Center had provided two days of staff development on the TIC resource materials in May and June of 1986 for two persons each from nearly all of the schools in the county; 68% later reported that they had shared information about TIC with their colleagues.

2. All schools surveyed had received the TIC Resource Guides, and 92% reported that they had received the computer software package that had been delivered with the guides.

3. About one teacher in each elementary school, one teacher for every two junior high schools, and one teacher for every five high schools reported making use of the TIC Resource Guides.

4. Of the TIC resource materials, the software packages were rated as useful by 75% of the respondents, the Resource Guides by 30%, and the *DataRelator* by 1%.

5. The TIC software programs reported to be used most often were *FrEdWriter, The Factory,* and *Magic Slate.*

6. Respondents indicated that they would be better able to use the TIC resources if they could receive intensive (1 to 3 days) site-based staff development that included individualized follow-up assistance.

More recent data reported in *An Assessment of Educational Technology Applications in California Public Schools* (Main, 1990), shed light on the long term impact of the TIC resource materials. The Main study sought information on the availability and value of the TIC resource guides and the catalogs of the Software and Instructional Video Clearinghouses. The author found that over half (52%) of the schools who have *TIC Guides* feel they are valuable, but the other group (48%) find them of limited value. Further information needs to be collected to determine why such a large percentage of schools feel the *TIC Guides* are of limited value.

Subsequent Developments. Beginning in 1986, the California TECC Software Library and Clearinghouse (located at the San Mateo County Office of Education) and the California Instructional Video Clearinghouse (at the Stanislaus County Office of Education) conducted evaluations of new releases of computer and ITV programming. The Clearinghouses then prepared and released printed updates of the original four TIC Resource Guides in 1987 and an update for all six TIC projects in 1988.

After the TIC orientation workshops, the TEC Centers assumed regional responsibilities for acquiring, maintaining and expanding software collections. These included not only the software programs that had been distributed to the schools by the state, but also other programs that had been determined to be exemplary or desirable.

Then, after the TEC Centers had been discontinued, the function of providing regional software repository services was assumed by a group of media/technology departments at district and county offices of education. The network of 17 California Software Resource Centers works under the supervision of the California Software Clearinghouse in updating the informational resources originally provided by the TIC programs and in providing schools with staff development and technical assistance services (see sections in this report on the Computer Software and Video Clearinghouses).

The *DataRelator*, produced to fit the rather severe limitations of computer hardware most readily available in the schools, did not prove to be helpful to classroom teachers and received very little

use in the field. Thus, it was not used in either the resource guide updates or for the *Technology in the Curriculum: Visual and Performing Arts Resource Guide* and the *Foreign Language Resource Guide*. It is expected that the CSUNet database will provide search features similar to the search capability of the *DataRelator* program.

VIII. Current Status

The printed TIC resource guides are still available from the CDE although they are now quite dated, and many of the original programs are no longer available. The California TECC Software Library and Clearinghouse has become the California Software Clearinghouse and has since moved to California State University, Long Beach. The Computer Software and Instructional Video Clearinghouses (described in separate sections of this report) are now responsible for evaluating technology programs and disseminating information about technology programming that meet the criteria of "Exemplary" and "Desirable."

The information in the TIC resource guides and subsequent updates is presently being converted into electronic database files and will become available on-line via the California Technology Project's Technology Resources in Education (TRIE) electronic information service using the California State University system's CSUNet. The new information resources are less structured than the original TIC Resource Guides and provide more qualitative and holistic information about programs with more focus on problem solving skill as suggested by the most recent California curriculum frameworks. The Computer Software and Instructional Video Clearinghouses will, it is expected, continue to provide these annual updates on computer and video programming.

IX. Strengths/Facilitating Factors

- The TIC Project produced computer and video program resource guides that helped many teachers select and make effective use of technology programs as tools to augment curriculum and instruction.
- The effectiveness of software and video programs was assessed by teams of experienced teachers so that other teachers would have a better idea of what programs would be effective. This reduced the potential likelihood that programs would be purchased, found inappropriate, and then not used.
- The TIC materials provided a framework for the staff development programs that were conducted by the TEC Centers and selected county offices of education.
- The TIC project had the potential to benefit most schools in the state that used technology.
- Each of the TIC projects identified curriculum areas that were lacking in high quality software. This information was used to determine curriculum areas to be addressed by state-funded software development projects.

X. Weaknesses/Constraints

- The assessment of software by teams of teachers did not include actual classroom trials of the programs with students.
- There was no formal evaluation of the impact of the TIC project.
- According to a CTP survey, less than half of the schools that received the *TIC Guides* found them to be of value.

- The *DataRelator* program (a relational database for selecting TIC software) cost $100,000 to develop but was found to have only a limited scope of information and was rarely used.

XI. Recommendations/Promising Practices

- The TIC guides should be updated to accommodate new curriculum frameworks, combined with the ongoing reviews conducted by the Computer Software and Instructional Video Clearinghouses, and redistributed to schools in both print and electronic database versions.
- The state should continue to support efforts to facilitate integration of technology into the curriculum by recommending technology-based materials that support and expand the curriculum.
- Develop TIC "exemplars" to accompany PQR guidelines and self-study procedures.
- Involve county office of education staff, CTP consortia, and SB 1882 Staff Development Consortia in future distributions of technology support materials.

Technology In the Curriculum (TIC) Software Distribution

I. Background

Project Summary. The Technology in the Curriculum (TIC) Projects were established to identify exemplary computer software and instructional television (ITV) programming that would support improved instruction in the core curriculum areas. TIC program applicants, in response to a fiscal year 1984-85 request for proposals, were to develop plans for analyzing the California Curriculum Frameworks and Model Curriculum Standards, reviewing existing computer software and instructional television (ITV) series, and for identifying high-quality programming that matched the curriculum.

The second component of the TIC program provided that the California Department of Education (CDE) would then purchase exemplary technology materials and distribute them to schools along with the other resource materials prepared by the four TIC projects.

Governance. Four TIC projects that focused on core subject matter areas were funded in 1985-86. The projects and their host and partner agencies (if any) were as follows:

Subject Area	Fiscal Agent and Partner Agencies
Language Arts	Santa Clara County Office of Education, KTEH/TV, Teacher Education and Computer Center, Region 8 (TECC 8)
History-Social Science	Far West Laboratory for Educational Research and Development,South San Francisco Unified School District, KQED-TV, Alameda County Office of Education
Mathematics	Lawrence Hall of Science, University of California, Berkeley
Science	Lawrence Hall of Science, University of California, Berkeley

Each of these projects produced an array of resource materials, including Resource Guides that served as "consumer guides" for selecting programming, and were distributed to over 7,300 public schools and technology resource centers in California. The projects also conducted workshops to familiarize staff of the Teacher Education and Computer Centers (TECCs) and county offices of education with the TIC materials.

The TIC software distribution project was coordinated by the Office of Educational Technology of the CDE through a management contract with Far West Laboratory. The software packages and TIC Resource Guides were distributed by the TEC Centers in cooperation with county offices of education throughout the state. In order to receive the materials, each school was required to send a representative to a short orientation session on ways to use the Resource Guides and sample software to integrate technology resources with the curriculum.

Two additional TIC projects were funded in 1986-87; these were Fine Arts (at the Los Angeles County Office of Education) and Foreign Language (Stanislaus County Office of Education). The distribution of exemplary software packages and providing TECC orientation sessions, however, were not a part of the Fine Arts and Foreign Language TIC projects.

Legislative Authority. Assembly Bill 803 gave the CDE the authority to address five major initiatives in support of other state-wide reform efforts in curriculum and instruction. One of the educational technology initiatives, curriculum materials development and acquisition, involved three separate grant programs, including the TIC projects, which, in turn, included the distribution of packages of exemplary software.

II. Project Planning

Project Origin. As recipients of competitive grants, all of the TIC projects were required to develop comprehensive plans addressing the goals and objectives set forth in the RFP (CDE, 1984b). In their grant applications, the prospective staff members of each of the projects had to propose how they would accomplish four major project tasks, including the following related to TIC software distribution:

> ***Material Acquisition.*** The TIC projects were to propose procedures for identifying and acquiring exemplary technology programming and distributing it to California schools.

Needs Assessment. The determination of what software would be included in the state distribution was both a needs assessment and an evaluation task. Each of the four TIC projects consulted with members of advisory panels, the teachers who participated in the materials evaluation teams, subject matter and technology specialists in the CDE, colleges and universities, and other education agencies and reviewed the results of the TIC software and video reviews to select the final programs distribution.

III. Project Description

Project Purpose. The primary purpose of the TIC Projects was to organize information about computer and video programs for teaching content in mathematics, science, history-social science, and language arts. The TIC projects identified parts of the curriculum best taught electronically or visually, identified high-quality programs available to teach that content, and designed lesson plans that teachers could use in the classroom. The TIC resource materials (including packages of exemplary software) that were distributed to each school, county office of education, and TEC Center were intended to help teachers achieve the learning objectives set forth by districts and the state.

The purpose of the TIC software distribution project was to provide schools with examples of highly rated software for which lesson plans had been developed in order to encourage the use of the TIC guides.

TIC Program and Project Objectives. The basic objective of the TIC Projects was to help teachers use technology to enhance and extend existing curricula. After the TIC guidelines were developed, the CDE decided that one way to maximize the benefits of the major effort would be to provide samples of good software programs to the schools along with the print and database resources. The specific objective of the TIC software distribution project was to encourage more effective use of the TIC resource guides by providing sets of exemplary computer software in every school in California. It was expected that once school personnel knew what was available and how it could be used, they would purchase and use appropriate additional software in their classrooms.

Project Emphases. As an extension of the TIC Projects, the software distribution project shared the essential design elements of the "parent" program. These included the following:

1. ***Curriculum.*** Curriculum Materials Development and Acquisition; the distribution of the TIC software packages was part of a set of initiatives designed to increase the overall impact of of the TIC program effort. Sending software to the schools was intended to enhance the TIC goal of encouraging teachers to make more use of educational technologies to teach current content more effectively and to provide them with opportunities to teach new content as well. By providing each school

with a set of software programs, the CDE expected to stimulate use of the TIC resources . This effort, in conjunction with other state-wide TIC-supported staff development initiatives (see the sections on the TIC Resource Guides and Summer Technology Training Institutes), involved a very substantial investment (over $10 million) on the part of the CDE in promoting educational technology.

The curriculum emphasis of the TIC software distribution project was on the K-12 curriculum in language arts, history-social science, mathematics, and science. The educational technologies emphasized were computers and instructional television. The software programs distributed to the schools included the following:

Program Title	Grade Level	Subject Area
Who, What, Where, When, How	K-3	Language Arts
That's My Story	K-6	Language Arts
Graphing Equations	9-12	Math
Magic Slate	K-8	Language Arts
The Factory	K-8	Math
Ten Clues	K-12	Social Science
Mickey's Space Adventure	4-6	Language Arts
Friendly Filer	4-6	Science
Narrative Writing	6-9	Language Arts
The Writer's Assistant	6-9	Language Arts
Oh, Deer!	6-9	Science
Writing a Character Sketch	9-12	Language Arts
Super Scoop	9-12	Language Arts
Science Tool Kit	9-12	Science
Island Survivors	7-9	Science
PFS: File with US History Database	7-12	Social Science
Heath Math Worlds: Sampling	6-8	Math
AppleWorks (Donated by Apple Computer)	6-12	All

2. ***Staff Development.*** In order to receive the packages of software, schools were expected to send at least one teacher to a training session. The training workshops were conducted by the TEC Centers. Each TEC Center had sent a 7-10 person team to a two day conference conducted by staff from the four TIC projects and the Office of Educational Technology. This "training of trainers" session was used to familiarize TEC staff with the TIC Projects and to plan for the regional distribution of materials and training. Since each TEC Center was responsible for training and dissemination within its own region, the type and length of training that teachers received varied somewhat. The sessions ranged from two hour orientations to two day in-depth seminars. (See also the sections elsewhere in this report on the TIC Resource Guides and Summer Technology Training Institutes.)

3. ***Learning Resources Management.*** The TIC software distribution project did not have a separate component involving learning resources management. However, because they were in place in every public school in California, the software packages were to become an important element in various state-wide efforts to promote more effective use of learning resources. The TIC software became an important part of the curriculum of staff development programs in educational technology throughout the state.

4. ***Dissemination.*** Similarly, because there was no dissemination component in the software distribution project, the TIC software packages became part of the outreach and technical assistance programs provided by other education agencies and projects, both on-going and temporary. Among these were the TEC Centers, the Summer Technology Training Institutes, and computer centers in district and county office media departments throughout California.

5. ***Evaluation.*** Again, because there was no evaluation component built-in to the TIC software distribution project, there was no separate assessment of the impact of the effort. A summary of the findings of other TIC evaluation projects is provided below in the section on Project Outcomes.

IV. Project Implementation

TIC Project Collaboration. The grant recipients of the first four TIC subject matter projects and the CDE's Project Coordinator were all located in the San Francisco Bay Area. Because of this geographic proximity and because the projects shared so many tasks in common, cooperation among the projects became a fact of both spirit and practice. After a joint meeting of the staff members of all four projects everyone readily agreed to use the opportunities to avoid the duplication of effort and to conserve project resources. Included among the collaborative ventures was the planning and implementation of the TIC software distribution project.

First, the four separate proposals for identifying, acquiring, and distributing exemplary ITV and computer programming that had been included in the original grant applications of the four TIC projects had to be consolidated. CDE officials then led discussions about criteria for establishing a single priority list of software from the four that would be identified by each of the projects. This was done because consultants of the Office of Educational Technology would be responsible for negotiating licenses for the exemplary programs. Then, one of the co-directors of the History-Social Science TIC Project agreed to manage the storage, packaging, and shipping tasks to be contracted through Far West Laboratory.

Separate packages of software were identified for seven different configurations of school grades; there were different packages for schools with grades K-3, K-6, 4-6, 5-8, 9-12, and K-12. Over 58,000 software programs were sorted into sets appropriate for each of the school grade configurations, packaged in color coded boxes with sets of the TIC Resource Guides, shipped to TEC Centers or county offices of education. Schools were advised to send at least one person to one two hour-long orientation session on the TIC resources at which time the materials were to be released for delivery to the school.

The TECC/county office TIC orientation/materials delivery sessions were conducted in the Spring of 1986 in most parts of the state. Educators in a few areas, however, had to wait until the Fall to receive the materials.

V. Project Support, Resources and Constraints

Adequacy of Support. Even a simple analysis of the economies of scale afforded by the state-wide distribution of the TIC exemplary software programs, in comparison with what the costs would be for individual schools to purchase the materials, leads to the conclusion that the TIC software distribution project made very efficient use of the educational technology funds allocated for the task.

Adequacy of Resources. After the CDE had completed negotiations with various software vendors for state-wide purchase of the exemplary software programs, Far West Laboratory subcontracted all of the services necessary for receiving, warehousing, packaging, and shipping the packages to the schools.

1. ***Project Budget.*** The expenditures from the fiscal year 1985-86 budget for the TIC software distribution included:

Materials licensing/purchase	$ 2,112,208
Far West Laboratory indirect costs, warehousing, packaging, shipping	86,128
Total	$ 2,198,336

2. ***Cost Benefits.*** The state-wide distribution of software was clearly cost-effective; in the *Sunset Report for AB 803* the Office of Educational Technology reported on the impact of the TIC software project:

> *In addition to over 7,000 [sets of] TIC Resource Guides, nearly 58,000 software packages were distributed. The software received by each school had a retail value of $300 - $750. All software programs but one were negotiated for the state, which in one case was 70%, the software purchases amounted to a savings of $1,578,364 over list prices. Apple Computer, Inc. graciously donated a program, AppleWorks, to each school with grades 6-12.*

3. ***Budget Equity.*** By virtue of its conception and design, the TIC software purchase and distribution project promoted equity among all schools since every school in the state was eligible to receive the software and training.

4. ***Leveraging and Institutionalization.*** It was intended that the free samples of software packages would serve as a seed to encourage schools to purchase additional copies for classroom use, thus leveraging additional local funds for technology utilization.

5. ***Budgeting Procedures.*** Because it was part of a one-time allocation of educational technology funds to extend the impact of the larger set of TIC program activities, the TIC software distribution project did not involve formal budgeting procedures beyond contract arrangements made with the Far West Laboratory which, in turn, handled the arrangements of subcontracting for handling and shipping.

VI. Outcomes

Achievements. Although the TIC software distribution project did not have a formal project staff to document and report on the accomplishment of project activities, there are a few sources of information about the outcomes of the project that provide at least a partial picture of its impact.

TIC Research. A survey in the Fall of 1986 of teachers and principals in San Mateo County by the director of the Teacher Education and Computer Center (TECC 17), attempted to determine the level of use of the TIC materials, the level and emphasis for future TIC training programs, and the software receiving the most use. Albeit a limited sample for making state-wide conclusions, the findings provided at least some data about the impact of the TIC software distribution effort:

1. As had the other TEC Centers around the state, TECC 17 provided two days of staff development on the TIC resource materials in May and June of 1986 for two persons from each of nearly all of the schools in the county; 68% later reported that they had shared information about TIC with their colleagues.
2. All schools surveyed had received the TIC Resource Guides and 92% reported that they had received their computer software package (delivered with the guides).
3. About one teacher in each elementary school, one teacher for every two junior high schools, and one teacher for every five high schools reported making use of the TIC Resource Guides, an average of less than one person per school.
4. Of the TIC resource materials, the software packages were rated as useful by 75% of the respondents, the Resource Guides by 30%, and the DataRelator by 1%.
5. The TIC software programs reported to be used most often were FrEdWriter, The Factory, and Magic Slate.
6. Respondents indicated that they would be better able to use the TIC resources if they could receive intensive (1 to 3 days) site-based staff development that included individualized follow-up assistance.

Subsequent Developments. The sets of TIC exemplary software were generally delivered to schools throughout California as one part of the TIC resource package. Schools received the resource materials at TIC orientation workshops at local TEC Centers. The workshops were part of the TIC Projects effort to ensure that at least some staff development accompanied receipt of the package. Afterwards the TEC Centers assumed regional responsibilities for acquiring, maintaining and expanding software collections, including not only the software programs that had been distributed to the schools, but also the other programs that had been evaluated as exemplary or desirable by the subject matter projects.

After the TEC Centers were discontinued in July 1987, the function of providing regional software repository services was assumed by a group of media/technology departments at district and county offices of education. The network of 16 California Software Resource Centers works cooperatively with the California Software Clearinghouse (described in another section of this report) located at California State University, Long Beach, in updating the TIC software program and in providing schools with staff development and technical assistance services.

VII. Current Status

There have not been any efforts to procure and distribute exemplary software to schools since the TIC software distribution project was completed in 1986, and none are presently contemplated.

VIII. Strengths/Facilitating Factors

- The state-wide purchase of computer software allowed substantial discounts to be negotiated with publishers.
- The software and sample lesson plans in the TIC resource guides facilitated the integration of software and video with curriculum programs.
- The distribution of software potentially benefited every school in the state; each school received TIC resource guides, sample software, and training.
- The free samples of exemplary software encouraged schools to purchase additional copies with local funding thereby promoting technology use.

- Teachers who attended the brief training were able to go back to their schools and immediately put what they had learned into practice.
- The software distribution provided an incentive for teachers to attend the TIC training sessions.

IX. Weaknesses/Constraints

- There was no formal evaluation of the impact of the TIC software distribution project. However, the continuance of the TEC Centers would have probably provided such evaluation.
- Since only one copy of each program was given to each school, teachers could not legally use the programs with more than one student at a time. Long-term state-wide licensing would have provided much access and use of programs.
- Software was not distributed in conjunction with the Foreign Language and Visual and Performing Arts TIC guides.

X. Recommendations/Promising Practices

- Distribute software/video packages with future equipment distributions.
- State-wide purchases of exemplary technology materials can save a great deal of money at the school when compared to the prices paid by individual schools.

Summer Technology Training Institutes

I. Background

Program History. During 1986 and 1987, the California Department of Education (CDE) supported a series of summer training institutes for teachers and other education personnel in the use of technology in the curriculum. The request for proposals (RFP) for the summer institutes noted that Assembly Bill 803 funds had been used in grants to schools to acquire computer and video hardware and for the acquisition of high quality software and instructional television programs and resources (CDE, 1985d). Schools frequently lacked staff who knew how to make effective use of technology in the classroom. The institutes were a spin off of the TIC projects in that teachers needed long-term in-depth training before they could make effective use of the TIC resources. TIC guides and technology-based materials were major resources for the summer institutes.

Program Purpose. The three major components of the CDE's overall strategy to promote the utilization of technology to enhance teaching and learning were hardware, software, and training. The need for intensive training, however, had remained largely unaddressed by AB 803 allocations. The summer institute program represented a major effort to redress the imbalance that existed in implementing the three components. The RFP defined the purpose of the institutes:

> *The purpose of the Summer Technology Training Institutes is to provide training at a level not readily available across the state, utilizing the latest and best information available on the content of the curriculum and the appropriate uses of technology for that content. The curriculum will include the design and development of specific units and lessons which integrate the use of technology with the content and the processes to be taught, and the use of applications packages and authoring programs both in the preparation of lessons and as a tool for instruction for student use. Participants will learn to identify and develop interdisciplinary uses of software and other technology to identify high quality instructional software, and map it to the curriculum. Participants will also learn to train others to fully integrate technology into everyday classroom practices, so that they can serve on an ongoing basis as exemplars in the use of technology throughout the instructional program.*

Governance. The Office of Educational Technology administered the grants awarded in the Summer Technology Training Institute program. Over the two years, there were nine summer institutes supported by AB 803 project grants that served nearly 1,200 teachers. The nine institutes were managed by faculty and staff in teacher education and educational technology at five state-supported institutions of higher education (IHEs), as follows:

Institution of Higher Education	Summer 1986	Summer 1987
California State University, San Bernardino	Elementary All Subject Areas (Two sessions)	Elementary All Subject Areas (Two sessions)
University of California, Berkeley (Lawrence Hall of Science) Science	Middle School Mathematics & Science	Secondary Mathematics &
California State University, Long Beach	Secondary English-Language Arts	
University of California, Santa Barbara	Secondary History-Social Science	

University of California, Irvine	Secondary English-Language ArtsHistory-Social Science

About 600 teachers and other educators took part in each of the two summer institute programs. Approximately 400 elementary grade level educators were "associates" in the two 4-week sessions held each year at the institutes at CSU, San Bernardino. Both of the mathematics and science institutes at UC Berkeley's Lawrence Hall of Science each year served 200 educators. Two hundred secondary school educators were enrolled in the 1987 UC, Irvine, institute and approximately 100 educators took part in each of the secondary institutes at CSU, Long Beach, and at UC, Santa Barbara, in 1986.

Legislative Authority and CDE Guidelines. AB 803 authorized the CDE to address five major initiatives in support of other state-wide reform efforts in curriculum and instruction. The TIC Projects, administered by the Office of Educational Technology, with the advice of the Educational Technology Committee, addressed the AB 803 curriculum materials development and acquisition initiative. In addressing this initiative, the CDE established three separate grant programs, including the TIC Projects, which in turn led to several new projects to extend the impact of the basic program. The Summer Technology Training Institutes were one of these new projects. The institutes were designed to instruct teachers in the use of the TIC guides and other technology resources.

II. Program Planning

Program Objectives. Each of the summer institutes recruited at least 100 trainees, to be grouped in approximately 25-30 teams of teachers and curriculum support specialists. The RFP required that applicants for the summer training institutes plan for five major components:

1. Four weeks of summer training (a minimum of 120 hours) to cover the prescribed curriculum.
2. Specific instruction in the training of others, in a "trainer-of-trainers" model, including the role and strategies of the trainers as "change agents."
3. Hands-on experience during the summer training in the design, implementation, and refinement of curriculum materials that utilized technology as an instructional tool.
4. A written commitment from each district sending participants to provide adequate access to hardware for implementation of an exemplary technology classroom, and to provide training time (released days, etc.) for summer participants to train others in the districts during the subsequent school year.
5. A follow-up component that would include follow-up personnel paid to provide support, assistance, facilitation, and other services as needed to participants as they implemented their skills in their instructional program, and as they served as trainers of other teachers.

The CDE assumed that improvements in student and teacher performance would result from the institute program:

1. Teachers who are thoroughly familiar with the characteristics of word-processing, data-base programs, graphics programs, and spreadsheets, will be able to utilize such programs, for example, to facilitate student skills and knowledge acquisition, as well as higher-order thinking skills, across subject areas.

2. Teachers who are skilled in the integration of technology within their own classrooms, whose daily lessons reflect knowledge of *when* technology is useful and when it is not, of *what* technology can do to enhance the curriculum, of *which* technology to select, and of *how* to integrate it. Such teachers can serve as a resource to others who are eager to develop those skills for themselves.

III. Program Development

Institute Program Emphases. The summer institutes were expected to provide training on the content of the curriculum and the appropriate uses of technology for that content. Institute participants were also to receive intensive training in ways to train other teachers in their local areas. The TEC Centers carefully selected participants for summer institutes that could also serve as trainers of others. Some TECC regions devised criteria and an application process to select participants. The curriculum of each of the institutes provided participants with a variety of topics that may be grouped in five component categories:

1. ***Curriculum.*** Each of the five middle school/secondary institutes focused specifically on technology use in one of the subject matter areas and the two elementary institutes focused on the use of technology across the core subject areas. The RFP required that the design of the curriculum and the instructional methods proposed for use in the institutes be based upon the curriculum content reflected in CDE curriculum publications (frameworks, standards and guidelines); the TIC resources (including the concept papers; the resource guides, and *DataRelator*); materials from the Effective Teaching programs; applications programs (such as word-processing, graphics, and data-base managers); and other materials that exemplified high quality instructional strategies, curriculum design, and integration of technology in the curriculum.

   Each institute was to provide two major training components: (1) the uses of technology within the curriculum and (2) training other teachers in the use of technology. Each component was to emphasize two features: (1) the relationship of the instructional approach to other curriculum reform initiatives in California and (2) the recognition of the diversity of needs of the student population in the state.

2. ***Staff Development.*** There were two dimensions to the staff development objectives in the training provided at the summer institutes: first, the institute participants were to be the *recipients* of staff development in the use of technology in the curriculum, and second, they were to the receive resources they would need to be *providers* of staff development in educational technology at their local sites. Hence, the "training of trainers" approach was applied.

   Each institute was expected to incorporate in its curriculum research findings about practices that could contribute to effective teaching and learning. Institute staff were advised to model effective teaching practices for the participants who themselves would later serve in staff development roles.

   In addition, the school districts sending teams to the institutes were required to make commitments to provide (1) both technology equipment and time for students to use it and (2) facilities and released time for institute participants to deliver technology training for additional teachers during the school year.

3. ***Learning Resources Management.*** One of the major objectives of all the educational technology programs of the CDE was the improvement of learning resource management.

It became an integral component in the design of the training and follow-up activities in the summer institute program. In addition to providing training on the TIC Project resources, the summer institutes were expected to guide participant teams in developing plans for integration of learning resources provided by other state-sponsored programs, which included:

- *Curriculum Implementation Centers (CICs):* seven agencies established to provide ongoing curriculum development, research, and dissemination in subject matter areas to California schools and districts.

- *Teacher Education and Computer Centers (TECCs):* a regional network of training resource agencies (15 in 1986 and 17 in 1987) with staff proficient in the use of technology applications, collections of technology hardware and software, and training facilities available to support staff development.

- *Mentor Teacher Program:* a state-wide cadre of teachers recognized by their peers for outstanding instructional skills who provided leadership in staff development as "lead teachers" in pre- and in-service programs or in school/district curriculum development.

- *California Curriculum Projects:* curriculum reform and improvement efforts supported by the CDE, including the California Writing Project (and regional affiliates) and the California Mathematics Project.

Each of the institutes established formal relationships with the appropriate CICs, TECCs serving the IHE regions, the appropriate Curriculum Projects. Mentor teachers, depending upon their expertise in the integration of technology in the curriculum, served as teacher-trainers or as participant-trainees.

4. ***Dissemination.*** The planning of the summer institute training programs in curriculum, staff development, and learning resource management training were, as has been noted, focused heavily on means to "export" the technology use training to other educators. The intense effort allotted to preparation for "outreach" reflected the major emphasis given to dissemination in the program.

   IHE applicants for the institute grants were required to propose a strategy for planning follow-up activities that would offer support, reinforcement of learning, and provide encouragement to implement dissemination activities in back-home settings. These outreach efforts were to fit in, build upon, or utilize existing resources and organizational structures, particularly the TECCs, CICs, and county office of education.

5. ***Evaluation.*** The RFP for the summer technology institute program stated that each project was expected to evaluate both its overall performance and outcomes and the performance, satisfaction, and learning of participants. Evaluation plans were to include provisions for obtaining information to modify or improve the institutes ("formative" evaluation) and to document and evaluate the training that participants were to conduct during the school year following the summer program ("summative" evaluation).

   The RFP for the 1986 summer technology institute program stipulated, however, that "no more than 1% of the budget should be allocated to evaluation" activities. Therefore, each of the four IHEs that conducted institutes in that year proposed formative evaluation strategies that involved the periodic collection of feedback from participants, for in-course corrections in the training program or adjustments in institute management. The collection of summative evaluation data, however, had to be limited to (1) evaluation

questionnaires completed at the end-of-institute training period and, in some cases, in follow-up training conferences and (2) reporting mechanisms built into follow-up training and dissemination activities. It was not possible for the institutes to collect rigorous evaluation data on the impact of the summer training programs on school practice or student learning.

When the RFP for the 1987 summer institutes was issued, the applicants were notified that reports to the CDE project coordinator would be required on a regular basis and that up to 5% of the project budget should be allocated to this evaluation. The CDE recommended that follow-up activities conducted by the three institutes be conducted in cooperation with the TECCs. The regionally based TECC support groups were expected to provide a more reliable means for collecting evaluative data, including observations in school settings, than had been possible after the 1986 institutes. As the new evaluation designs were being implemented in the summer of 1987, however, the Governor vetoed the funds appropriated for the TECCs, and all were discontinued.

IV. Program Implementation

Each of the Summer Technology Training Institutes provided four weeks of training in campus settings and scheduled a minimum of 120 hours of instructional time, including practical or technology lab experiences. Room and board in college residential facilities were provided for participants who did not live within reasonable commuting distance. The budgets were required to allocate $600 per participant to be paid as a cash stipend or a personal computer or other incentive.

The training programs of all institutes began with presentations on the TIC Project resource materials and then proceeded to specific subject matter curriculum content and technology applications. Among the specialized areas in the training programs of the different institutes, were the following:

Elementary. In two 4-week sessions in both 1986 and 1987 at the CSU San Bernardino institutes, 400 participants experienced training that drew its content from the six core areas of the TIC Projects, including fine arts and foreign languages. The use of technology in the elementary grades was demonstrated by the utilization of tools, including computer graphics. Participants were also able to experience the use of some software and video programs considered exemplary by the TIC Project. Efforts were also made to equip teachers with technology tools, skills, and knowledge that would strengthen instruction and learning for all students, including those with special needs.

English-Language Arts. At the 1986 institute at CSU Long Beach, the training for 100 secondary school educators emphasized the use of word-processing software in the teaching of writing. Also emphasized was the design of instruction using TIC identified software and the use of instructional video programming to teach literature. The training relied extensively on resources from the California Writing Project, the *Handbook for Planning in Effective Writing Program*, and the *Model Curriculum Standards*. The training provided during the 1987 summer institute at UC Irvine for 100 English-language arts teachers and 100 history-social science teachers emphasized both subject-specific and interdisciplinary use of technology that cut across the curriculum. Included was the use of page-layout software, desktop publishing, databases, telecommunications and video resources. Participants were challenged to design interdisciplinary instructional materials utilizing technology to demonstrate the relationships among the disciplines.

Mathematics and Science. The interdisciplinary training curricula for 200 middle school educators (1986) and 200 high school educators (1987) at UC Berkeley's Lawrence Hall of Science, emphasized the content from both curriculum areas of the TIC materials, the *Model Curriculum Standards*, the California Science Curriculum Frameworks. The institute emphasized interdisciplinary applications of technology. These included sessions on using computer and video resources in both general science courses (earth, life, and physical science) and in discrete disciplines (biology, chemistry, physics, etc.). In addition, institute participants had experience in using various technology applications, simulations, video recording, and electronic instruments and devices to monitor, record, and analyze data, to provide corrective feedback in experiments, and to assist in solving scientific problems. Special emphasis was also given to developing approaches that encouraged more equal uses of technology among male and female students.

History-Social Science. At the 1986 institute at UC Santa Barbara, instruction for 100 social science educators focused on the diversity of content in the secondary History-Social Science Curriculum Framework and the *Model Curriculum Standards* . Both were reflected in the curriculum scope and sequence prepared for the TIC Resource Guide. Emphasized were basic study skills and critical thinking skills underlying the study of history and the social sciences. The curriculum at the interdisciplinary institute in 1987 at UC Irvine, for 100 social studies teachers and 100 English-language arts educators, as noted above, emphasized both subject-specific and interdisciplinary use of technology that cut across curriculum boundaries. These included the use of page-layout software, desktop publishing, telecommunications, databases, video resources, etc., that cut across curriculum boundaries. Both the nature of information and the role of electronic media and technology were curriculum topics that provided opportunities to integrate learning about the role of technology while using it in the teaching of literature, drama, writing, history, and political science. Participants designed interdisciplinary instructional materials utilizing technology to demonstrate the relationships among the disciplines.

V. Resources to Support the Program

Support Factors. The deliberate linkages with other state sponsored initiatives to support the improvement of curriculum and instruction which were required for the IHEs receiving grant awards in the Summer Technology Institute Program provided participants with a broad base of resources to draw upon in their back-home implementation activities. The cooperation among the summer institutes, TECCs, CICs, California Curriculum Projects, and others, was expected to yield benefits to the state-wide school improvement effort that would exceed the sum of the individual parts.

Firm commitments from their districts (or other agencies) to provide essential resources was intended to increase the likelihood that classroom teachers returning to their schools would have access to adequate technology hardware and software and time for students to use equipment. Such commitments, when districts were able to honor them, were reported to increase the level of support provided to institute teams by their local school agencies.

The 1986 institutes found that by involving TEC Center staff in the summer training components and, particularly, in regional follow-up activities, that there was a considerably higher level of impact on local technology implementation and staff development. The results were believed to be so positive that the CDE recommended that the IHEs receiving 1987 institute awards build-in organizational linkage with the TECCs to enhance the effectiveness of the follow-up components.

Institute Facilities. The summer institutes were all conducted in university settings. Participants generally found these academic environments comfortable and intellectually stimulating and most appreciated the opportunity to return to such professionally rewarding situations. One UC Santa Barbara institute participant expressed this feeling, "At last, I was to be invited into an environment which was as close to professional heaven as I would ever know. I was literally paid to go back to college and study the second most exciting part of being in this business, technology (the first being kids, of course!)"

VI. Program Support, Resources and Constraints

1. ***Program Budgets.*** The CDE provided $6 million for the Summer Technology Institute Program out of the budgets for three fiscal years, awarding approximately $500,000 to the IHEs for each 100 participants trained, as follows:

1984-85	$ 2,903,459
1985-86	995,847
1986-87	2,001,678
Total	$ 5,900,984

   The variety of district commitments and partnerships with other state-supported programs business/industry, direct and in-kind contributions of staff time, and hardware/software gifts and loans, added to the total investment made by the CDE.

2. ***Cost Benefits.*** The determination of whether or not the training provided to the 1,200 participants (for approximately $5,000 for each person) was cost-effective was not attempted. This may have prompted the Legislative Analyst to recommend that the CDE "evaluate the cost-effectiveness of the various summer institutes, and compare them to other approaches to training educators in the uses of educational technology" (Sunset Review).

3. ***Budget Equity.*** There were reports that the short time allowed for educators to prepare team applications and obtain statements of district support made it impossible for teachers in some large districts to take part in the institutes.

4. ***Leveraging and Institutionalization.*** As mentioned above, the organizational linkages and partnerships established with other agencies and businesses, clearly extended the impact of the state's funding investment beyond the limits of the grant awards. The long-term effects of the team-training programs within and among the hundreds of schools and districts from which the institute participants came can only be surmised to be extensive.

VII. Outcomes

Program Findings. Exchanges among CDE officials and the Office of the Legislative Analyst provide illuminating insights into the policy issues associated with programs such as the Summer Technology Training Institutes. The Sunset Report on AB 803, prepared in March of 1987 by the Office of Educational Technology (before the 1987 summer institutes had been conducted), did not report on the outcomes of the 1986 summer institutes other than to state:

> *Each institute, managed by an institution of higher education, provided four weeks of intensive training in the application of educational technology to a curriculum for 100 or 200 teachers, for a total of 600 participants. Participating*

Teachers received room and board plus either a modest stipend or a computer and modem.

In March of 1988, responding to questions from the California Legislative Analyst's Office about (1) CDE recommendations to continue the summer institute program and (2) about the outcomes of the program, the Office of Educational Technology reported:

1. At the time the Sunset Report was written, we anticipated that summer institutes would be held in the summer of 1987, training 600 teachers in addition to the 600 trained in the summer of 1986. The summer institutes for 1987 were funded out of budgets for two fiscal years: $1 million from 1986-87, and $2 million from 1987-88. When the Governor reduced the AB 803 budget, the institutes were already in operation, and the Educational Technology Committee voted to maintain the previously allocated funding, at $2 million. However, there was no money to initiate institutes for the summer of 1988.

The [training-of-trainers] model used during both 1986 and 1987 did focus on training teachers to return to their schools/districts as trainers as well as users of technology. That model has proved valuable, although evaluation information from the 1986 institutes suggests that most teachers are not ready to train others until the spring of the year following summer institute attendance. We would continue to use a trainer-of-trainers model in any future institutes.

2. The evaluations of the 1986 institutes varied in their focus as well as in the level of detail. We have not yet reviewed those reports in sufficient detail to provide estimates of the numbers of additional teachers trained. We would be happy to review the lengthier reports at your convenience at our office. Evaluation reports from the 1987 institutes will not be available until July 1988. For more specific information about the 1986 institutes, you may wish to contact the project directors, who may be able to provide information not included in the evaluation report. In particular, the directors of the institutes at San Bernardino (elementary) and at Lawrence Hall of Science (secondary math/science) have been in touch with 1986 participants throughout 1987, and those directors are likely to have the most reliable estimates of actual "spread" of the training, as well as effects on schools.

In *The Educational Technology Local Assistance Program: A Sunset Review*, based largely on a review of the CDE's Sunset Report on AB 803, the Office of the Legislative Analyst concluded the following about the summer institute program:

In response to our inquiries, [CDE] department staff stated that evaluations of the 1986 summer institutes (the only evaluations currently available) "varied in their focus as well as their level of detail." They further stated that the department had not reviewed the evaluations in sufficient detail to provide estimates of the numbers of additional teachers trained by the participants in the summer institutes.

We think that this information, together with some measurement of the effectiveness of the training (for both participants and those trained by them) is necessary, if the Legislature is to make an informed decision regarding the continuation of this component of the Educational Technology program. For this reason, we recommend that the summer institutes — as well as all of the other components of the Educational Technology program — be subject to the kinds of rigorous evaluation requirements discussed earlier in this report.

Institute Findings. The evaluation reports prepared by the summer institute project directors were limited, for the most part, to data about participant responses to surveys conducted during the summer sessions (formative) and at intervals during the follow-up year (summative). The evaluation reports provided little direct information about the planning and organization of the institutes, the content of the curriculum or nature of practical experiences provided, or the facilities provided for participants. Information is generally provided, though, on participant evaluation of presenters and presentation topics, support for follow-up activities in back-home settings, and overall value of the institute to the participants' professional work. Not all of the summer institutes, however, prepared summative reports.

UC Santa Barbara. One of the secondary grade level institutes, The Institute for Application of Technology to the History-Social Science Curriculum at UC Santa Barbara, however, provided considerably more information about the factors that influenced the outcomes of the institute than the other institutes (Copeland, 1987). The UCSB institute evaluators used a proven, reliable research method to ascertain the effects of the institute experience on participants. They employed the Concerns-Based Adoption Model (CBAM) to assess changes in the levels of concern that participants felt about adopting technology innovations. Using pre- and post-institute training measures, the project evaluators found that over the course of the summer the concerns of the participants shifted from anxiety about using innovative technology tools to concern about using the technology with students and colleagues. The evaluators judged that the institute emphasis on helping participants develop technological skills, while at the same time exploring various implementation techniques and planning for staff development activities, had a very positive effect on the outcomes of the institute.

The value of providing a physical environment conducive to learning (already noted above) was particularly important in this very favored geographic location, as noted by the institute evaluator. The evaluation placed major emphasis on the importance of recruiting participants who are outstanding teachers and leaders in the profession. Organizing the participants in small task and special project groups, "to address the unique needs and concerns of those in history-social science education," also proved very effective.

In evaluating the outcomes of the year-long support network, the UCSB evaluators concluded that at least two-thirds of the participants were able to assimilate new technologies into classrooms and to pass on the skills and information they had gained to other teachers in their schools and districts. The factor that most limited the efficiency of the participants in their dissemination activity, however, was the bureaucratic inertia that exists in educational agencies; it often took a full year to begin to put a new program in place. The evaluators concluded that with follow-up support beyond the one-year time frame allowed in the grant, that even greater accomplishments could be obtained. In summary, the UCSB evaluation reported:

One of the most enlightening discoveries of this evaluation was the empowerment of teachers. As the Institute participants interacted with administrators, gained knowledge about district financial resources, and got involved in decision-making processes, they became more confident in themselves as educators. They discovered new roles for themselves within the educational system, as trainers of other teachers, technology experts, change agents, and curriculum designers. They discovered that they could implement new ideas, and effect change in the system. . .

The fact that the Institute was able to change the way teachers think about themselves as educators is likely to have a long-term effect on school programs, and ultimately, the students involved in those programs. Long after the . . . Institutes cease to exist, and the AB 803 grant money has been spent, teachers will be incorporating into California classrooms the benefits gained from the new technological expertise and self-awareness acquired by participating in this unique opportunity.

CSU Long Beach. The evaluation report of another of the 1986 secondary grade level institutes, the English and Language Arts Summer Technology Institute at CSU Long Beach, provided information about the responses of participants to surveys conducted at the end of each week in the summer session and to a year-end survey completed in May of the following year. The CSULB evaluators reported "significantly high positive perceptions about most aspects of the Institute, the relevance of the summer training, and Institute objectives were maintained throughout the academic year" (May, 1987). Less positive, however, was the conclusion about the level of support that participants found in their follow-up activities; "District support was not adequate, in most cases, to successfully incorporate technological innovations into the curriculum." The report also noted outcomes associated with staff development and technology integration:

As evidenced by the types and number of [inservice presentations] provided during the academic year, there have been modest gains in the skills of Institute participants in this competency area. There is considerable evidence to suggest that these skills will be fostered in the coming year and additional district support and interest may increase the potential for growth in this area.

Substantial innovations to the curriculum have been effected by some of the participants; however, most participants were successful at only a minimal incorporation of technology into the classroom.

CSU San Bernardino. The opportunity to make longitudinal and comparative analyses of data about institute outcomes between and among the participants in the four different Elementary Summer Technology Training Institutes held in 1986 and 1987 at CSU San Bernardino make the evaluation reports of this institute uniquely important. (See Blurton, 1987 & 1988.) In reporting on the results of a survey of the "ESTTI Associates" conducted in the spring of 1988, the institute evaluators reported that "the benefits to be derived from a program like ESTTI are long-term and continuous" (Blurton, 1988). The evidence suggested that the institute training enabled former participants to increase job status within a school or district and to be able to "exert progressively more influence on how much money districts spent acquiring software and hardware." In noting that "follow-up support from a program like ESTTI is essential," the CSUSB evaluators concluded that the Associates might not have increased in influence and productivity if continuing support from ESTTI staff had not been provided. Among the other findings from the evaluation (Blurton, 1988; emphasis in the original) were the following:

The amount of hardware available in ESTTI teachers' own classrooms continues to be inadequate. This is especially disturbing when one considers that ESTTI Associates, <u>prior</u> to participating in ESTTI Summer Institutes, solicited and

receive letters of support for ESTTI's goals from their school district superintendents.

The single most important factor in promoting the use of instructional technology may be the presence of at least one technologically competent individual at each school site. The importance of training programs like ESTTI is obvious: i.e., as a vehicle for providing schools with such individuals.

One of the most crucial administrative actions a principal can take, in addition to providing the presence of a technologically competent individuals (sic), is to provide release time in which to plan or to attend inservice sessions about technology.

It is crucial that any multiple subjects technology training program address concrete applications across curricular areas. Associates felt that the single most important aspect of their ESTTI training had been concrete suggestions about incorporating technology within each academic content area taught at the elementary level.

UC Berkeley (Lawrence Hall of Science). The evaluation reports of the 1986 and 1987 institutes in mathematics and science that were provided for this report reflect careful attention to assessment planning. (See Stage, 1987 & 1988.) The reports were developed from extensive sets of formative and summative evaluation data: the 1986-87 Middle School Math Science Technology Institute (MSTI) included a comprehensive interim report (with copies of daily schedules and evaluation feedback summaries) and a final report with complete summaries of follow-up activities and results of data collection procedures. Daily feedback instruments led to daily adjustments in the curriculum program of each institute and provided anecdotal data for summative assessment reporting. Responses to questionnaires sent to institute participants during the school year activities provided data on the longer-range outcomes relating to (1) the implementation of technology in classrooms, (2) dissemination of technology information to other educators, (3) use of the MIX telecommunications system to maintain contact among institute staff and participants during the follow-up year, (4) follow-up activities to receive college credit, and (5) participation in regional meetings of institute personnel.

Conclusions about the overall impact of the institute experience were drawn from self-reports of participants about changes in teaching methodology, modeling effective teaching practices, confidence in creating awareness about and motivation to use technology in staff development programs, the benefits of networking with institute colleagues, and the development of technical knowledge. The institute evaluators (Stage, 1988) concluded:

Participants in MSTI praised the experience as one which provided new teaching methods, presented technology in a non-threatening, supportive atmosphere, revived interest in teaching as a profession, brought new associations and contacts, and evoked a missionary spirit to educate colleagues about technology. The follow-up year provided many opportunities to try out new ideas and methods. Periodic regional meetings and site visits allowed participants to talk about their experiences and receive feedback from their colleagues and MSTI staff. Instructors were available through by phone throughout the year to provide assistance or answer questions. Local conferences and state-wide conventions

allowed some MSTI teachers to participate as speakers; other had the opportunity to become "renewed and recharged" through sharing discussions, problem solving, and exposure to new developments in technology and education.

UC Irvine. The staff of the interdisciplinary English-language arts/history-social science institute at UC Irvine did not submit an evaluation report to the CDE at the conclusion of the 1987 summer institute. In a telephone interview with staff of the California Educational Technology Assessment Project at the Far West Laboratory, the former director of the UCI project stated that a report was not submitted because, in the turmoil following the Governor's veto of educational technology funding in the summer of 1987 (which necessitated reallocation of remaining technology funds) the CDE's project monitor in the Office of Educational Technology had not asked for one.

VIII. Current Status

Continuation. The Summer Technology Training Institute program was not continued under the current educational technology legislation, AB 1470, that succeeded AB 803, and there are no plans at present to seek authority to support another program. However, the CTP and regional consortia offer one week Technology Leadership Academies which provide training to support specific curriculum areas. These programs will be discussed in the Phase II report.

Telephone Interviews. CETAP staff members have conducted telephone interviews of a random sample of former Summer Technology Training Institute participants. The results of this interview are reported in Phase III of the CETAP report.

IX. Strengths/Facilitating Factors

- The responses to a CETAP telephone survey of teachers who had attended the institutes were exceptionally positive -- all but a few respondents expressed interest in attending future institutes.
- The use of universities as institute sites was reported to be both cost-effective and intellectually stimulating to the teachers.
- The Summer Institute Project helped to integrate the resources available from other state-supported projects, such as the Curriculum Implementation Centers (CICs), the Teacher Education and Computer Centers (TECCs), the Mentor Teacher Program, the TIC Projects, and the California Subject Matter Projects.
- Teacher response to the program was very positive, and most stated that the information received was highly useful.

X. Weaknesses/Constraints

- The evaluations conducted by the directors of the nine institutes were inconsistent and lacked means to assess effects of institute training on student performance.
- There was frequently a lack of district support (funding for hardware, software, released days, and the like) for the teams of teachers to disseminate information after the institutes.
- Little follow-up was conducted to determine how well teachers had disseminated the information received from the institutes at their own schools and districts.
- In many cases the teams of teachers were not able to work as teams to provide staff development after the institute, as was planned.

- Only a limited number of teachers was able to attend the institutes due to cost, summer commitments, and limits on the numbers who could attend for a LEA team.

XI. Recommendations/Promising Practices

- Some form of summer institute program should be conducted in the future.
- Establish technology use institutes co-sponsored by selected MTS projects and CTP and ITV agencies.
- Explore various institute models including one week sessions spread over the school year. This will be particularly important as increasing numbers of teachers are in year-round schools.
- Assess the cost-benefits of institutes including follow-up on the training of trainers component (if included).

California Instructional Video Clearinghouse

I. Background

Program History. The California Instructional Video Clearinghouse has, in effect, evolved from a cooperative group of media department directors in ten county offices of education, the Area IV Instructional Media Consortium. This collaborative, originally set up in 1982 to jointly purchase instructional television (ITV) programming, turned instead in 1983 to address the need to develop criteria for evaluating video programs. By 1985 the evaluation project involved 33 county office media centers in Northern California and had become formally established as the California Media Evaluation Project (CalMEP).

In 1986, the Office of Educational Technology of the California State Department of Education (CDE) invited the Stanislaus County Office of Education in Modesto to submit a proposal to establish a state-wide Instructional Video Clearinghouse. In response, the Stanislaus County Office (1986) submitted a proposal on August 20th, and the CDE awarded the contract shortly thereafter. In general, the Clearinghouse was established to coordinate the evaluation of instructional video and to disseminate information about high-quality programming to schools throughout the state.

Legislative Authority. Assembly Bill 803 provided funds to support the Technology in the Curriculum (TIC) Projects and the network of seven regional Instructional Television Agencies, described in other sections of this report. The four original TIC projects, funded in 1985, developed resource materials in mathematics, science, history-social science, and English-language arts. Two additional TIC projects, in foreign language and visual and performing arts, were funded during 1986.

When the six subject matter TIC projects had completed the evaluations and published the resource guides, the Office of Educational Technology was faced with the problem of updating and revising the materials. As summarized in the CDE's (1987a) *Sunset Report for Assembly Bill 803*, the situation required prompt attention:

> *In order for the TIC Resource Guides to remain a valuable resource, however, the information in them must be updated on a regular basis. Each year hundreds of computer and video programs are released that have potential applications in California curriculum. To review these newly released programs for quality and match to curriculum, $200,000 in Assembly Bill 803 funds have been allocated to each of two agencies. The San Mateo County Office of Education Software Library and Clearinghouse has had extensive experience in computer software evaluation and will provide, with assistance from the Curriculum Implementation Centers (CICs), quality reviews and curriculum match analyses in the subject areas of the first four TIC projects. The Stanislaus County Office of Education Media Center will provide a similar service for video materials. The two agencies will prepare jointly a TIC Update Guide, which will be distributed to all schools in the state in 1987.*

The Instructional Video Clearinghouse, and its companion project, the California Computer Software Clearinghouse, received fiscal year 1986 AB 803 funds to update and expand the work of the TIC projects in organizing information about video and computer programs that would serve as tools for teaching subject matter content. Both of the Clearinghouses have been funded

each year since and have been continued under the current educational technology legislation, AB 1470.

Administration. The Instructional Video Clearinghouse is administered by the Stanislaus County Office of Education (which also serves as the fiscal agent for the project) under the supervision of the CDE's Office of Educational Technology. Eight county offices presently serve as "evaluation satellites" for the Clearinghouse. These include:

County Office/Department of Education	Curriculum Evaluation Subject Area
Alameda	Guidance, History-Social Science, Sex Education, Language Arts
Los Angeles	Science, Guidance, Health, Sex Education, Substance Abuse
Monterey	History-Social Science, Guidance
Riverside	History-Social Science, Language Arts, Guidance
Sacramento	Driver's Education, Health, Substance Abuse, Science
San Diego	Language Arts, Guidance
Santa Clara	History-Social Science, Language Arts, Guidance
Stanislaus	History-Social Science, Substance Abuse, Mathematics, Music, Foreign Language, Science, Language Arts

II. Planning

Clearinghouse Planning Priorities. The Instructional Video Clearinghouse prepares an annual plan in the form of a proposal to the CDE for continued funding. Each year, plans are formulated to use the proven, consistent evaluation process in providing state-wide, cost effective updates of video programming. Over the years, the Clearinghouse has expanded the scope of its system of "Cooperative Preview Networking" to evaluate instructional video to identify "Desirable" and "Exemplary" programs that are aligned with the California Curriculum Frameworks in history-social science, English-language arts, science/health, mathematics, foreign language, visual and performing arts, and sex education/family life.

Needs Assessment. The director of the Instructional Video Clearinghouse is a participating member of the California Instructional Video Consortium (CIVC), a cooperative group composed of the seven regional ITV agency directors and appropriate staff members and representative county office media directors. Originally an informal group to coordinate state-wide delivery of ITV services, CIVC is now charged with advising appropriate state agencies and organizations about the evaluation, acquisition, development, distribution, and utilization of instructional video and other emerging technologies. Through interaction with these agencies and consultants of the Office of Educational Technology, Instructional Video Clearinghouse staff members collect information about needs for evaluation and dissemination. Goals and objectives for the Clearinghouse are thus developed each year in response to developments in the schools and ITV community.

Program Governance. The day-to-day operations of the Clearinghouse are under the direction of the Director of the Instructional Video Clearinghouse, who also serves as the Director of the Stanislaus County Office of Education's Instructional Materials Center. A consultant of the Office of Educational Technology is assigned to serve as the project monitor and provides oversight for the CDE.

The directors of the evaluation satellites make recommendations to the director of the Instructional Video Clearinghouse regarding evaluation timelines, procedures for obtaining products, evaluation criteria and guidelines, and evaluator training practices.

III. Program Development

The goals of Instructional Video Clearinghouse are refined each year, developing over the years from a set of rather general statements of purpose in 1986 to considerably more detailed descriptions of "goals and activities" in more recent years. The goals presented in the original proposal (Stanislaus County Office of Education, 1986) were as follows:

1. Continue and expand the work completed by the six TIC projects.
2. Evaluate video programs and correlate with state curriculum.
3. Coordinate with regional ITV agencies the evaluation of broadcast ITV series.
4. Coordinate video evaluation activities for the 15 TECC regions in California.
5. Provide support services in the areas of video evaluation to the seven regional ITV agencies and the 15 TECC regions.
6. Expand the base of information on instructional video programming (both broadcast ITV series and single-focus) in California, enabling media centers and ITV agencies to select the highest quality programming for acquisition.
7. Share evaluative information with interested agencies (media centers, ITV agencies (TECCs, CICs, producers).
8. Encourage media directors and ITV regional agencies to have a more active involvement in TIC project activities.

By 1988, the TEC Centers had been discontinued, and the Instructional Video Clearinghouse refocused its regional support efforts (from Goal 5 above) to providing "support services in the areas of video evaluation to the seven regional ITV agencies, county media centers, and district film/video centers" (Stanislaus County Office of Education, 1988). In addition, several offshoot projects of the TIC program (training TEC Center staff members to deliver the TIC resource materials and summer technology training institutes for teachers) had been concluded and the goal of encouraging involvement in TIC project activities, Goal 8, had been achieved.

Program Components. As one of California's major educational technology support projects, the Instructional Video Clearinghouse is expected to provide services that complement and extend the impact of other CDE school improvement initiatives. Of necessity, this involves staff members of both the Clearinghouse and satellite sites in a complex set of relationships with other educational technology programs, other CDE units, and various educational agencies and organizations. These include: the seven regional ITV Agencies, consultants in each of the subject matter units of the Curriculum and Instructional Leadership Branch of the CDE, the California Curriculum Projects (Literature, Mathematics, History-Social Science, etc.) the Pacific Mountain Network (PMN), the California Media Library Educators Association (CMLEA), and selected California Technology Project (CTP) Regional Resource Consortia.

Relationships with other organizations include the National Association of Regional Media Centers and the Association for Educational Communications and Technology (AECT).

Program Emphases. The objectives of the Instructional Video Clearinghouse for fiscal year 1988-89, the last year for which funding was provided by AB 803, served to illustrate the breadth of activities undertaken. The activities of the Clearinghouse may be arrayed in several, frequently overlapping, categories of activities, including curriculum (C), staff development (S), learning resource management (L), dissemination (D), and evaluation (E) as indicated in Table 1 below.

Table 1. Instructional Video Clearinghouse Objectives

	Objectives	C	S	L	D	E
1.	Review the evaluation process with each of the directors of the satellite centers. Streamline the process to maximize efficiency.					X
2.	Update the training of at least 300 of the evaluators who served during the 1986-87 and the 1987-88 school years.		X			X
3.	Train 300 additional teachers to be critical instructional video evaluators.		X			X
4.	Design, monitor, and evaluate the activities of the eight Clearinghouse satellite centers.		X			X
5.	Complete 8,400 evaluations for 1,200 titles (seven evaluations per title).					X
6.	Align the programs with state curriculum frameworks in the six Technology in the Curriculum (TIC) subject areas, family life and sex education, and substance abuse and refusal skills.	X X		X		
7.	Collect and disseminate analytical evaluations of instructional video programming to media center personnel, regional ITV agencies, and producers.				X	X
8.	Publish the two-volume *California Index of Instructional Video* in September 1988, and March 1989.	X	X			
9.	Verify the curricular match for 3,000 titles and enter the information into the database.	X			X	X
10.	Implement an electronic retrieval system that will enable four sites in the state (Los Angeles, Kern, Alameda, and Shasta County Offices of Education) to access the Clearinghouse database	X	X			
11.	Maintain contacts with commercial and governmental/non-profit video producers.				X	
12.	Assist the California Department of Education in the evaluation of ITV series or stand-alone programs submitted for state buy-out consideration.	X		X		

1. ***Curriculum.*** The Instructional Video Clearinghouse was created to continue the efforts of the TIC Project to increase the use of high quality educational technology programming in California schools. Toward this end, the Clearinghouse has worked to update and expand the information materials produced by the original TIC projects in history-social science, English-language arts, science (and later, health), mathematics, foreign language, visual and performing arts, and sex education/ family life. Ongoing activities include the identification of video programming that supports the themes and concepts that are defined in each of the California Curriculum Frameworks.

2. ***Staff Development.*** The delivery of staff development in the effective use of instructional video directly to teachers is provided primarily by the regional ITV agencies. Other than occasional presentations about Clearinghouse activities at educational technology conferences, the Instructional Video Clearinghouse does not provide direct professional development services. Its major contribution has been

to train a cadre of educators throughout California to evaluate new technology resources using criteria for instructional design, content, curricular match, and technical quality and to identify potential classroom applications for specific grade levels. In addition, the Clearinghouse contributes to professional development more broadly through the preparation and dissemination of video informational materials for other staff development specialists to use in field programs.

3. ***Learning Resources Management.*** The Instructional Video Clearinghouse was established to promote learning resources management on a state-wide basis. The resource materials about instructional video produced by the Clearinghouse serve as tools for increasing the effective use of learning resources in the hands of educators in the schools.

4. ***Dissemination.*** Since it was established in 1986, one of the major responsibilities of the Instructional Video Clearinghouse has been to develop and disseminate resource materials about instructional video programs that support the California curriculum. During the years that the Clearinghouse was supported with AB 803 funding, through fiscal year 1988-89, nearly all of the video information resources developed were print materials. A pilot test of the California Online Database of Video and Software Evaluations was completed in the spring of 1989 to test the feasibility of using electronic media in place of print media. The findings of the pilot test were used in developing the Technology Resources in Education (TRIE) now being installed in the telecommunications system of the California State University System, the CSUNet database.

   TRIE may be accessed by teachers through a local telephone call or reasonably priced toll call. It is now anticipated that, when it becomes fully operational, the TRIE database will serve as the primary dissemination vehicle for both the Instructional Video and Software Clearinghouses.

   Another frequently unnoticed outreach function of clearinghouses is in communications with the main "clients" of the program, educators throughout the state of California. Staff personnel of the Instructional Video Clearinghouse spend a great deal of time each day answering inquiries about instructional video from media center personnel and teachers, many referred by CDE personnel, on the telephone and through the mail.

5. ***Evaluation.*** Complementing the major responsibility for disseminating information about the resources of the Instructional Video Clearinghouse is the evaluation of instructional video programming, the first step in the process. The system of using eight satellites, that was established by the Clearinghouse, permits specialists in educational technology and curriculum subject matter areas to assess the quality of new video programming. More recently, the Clearinghouse has expanded the scope of its evaluation efforts to include instructional videodisc programs and computer interactive videodisc programs, the latter in a cooperative effort with the Computer Software Clearinghouse.

IV. Program Implementation

Clearinghouse Activities. The Instructional Video Clearinghouse undertook 17 major tasks in its first year of operations, 1986-87, to implement the plan that had been proposed to the CDE. These tasks included the following:

1. Identify and negotiate arrangements with seven satellite evaluation centers to assist in the evaluation of video programming to be included in the 1987 TIC Update.
2. Prepare and execute contracts with the satellite evaluation centers to ensure responsibility for identifying and coordinating training of educators to serve as evaluators, processing 400 videocassette programs from producers, circulating tapes to the evaluators (five for each program reviewed) and obtaining completed evaluations, arranging for specialists to assist in aligning the programs with the state curriculum frameworks, returning videotapes to producers, and forwarding completed evaluation forms to the Clearinghouse.
3. Construct matrices for aligning video programs with the curriculum frameworks in each curriculum area. This was done in concert with the Computer Software Clearinghouse.
4. Determine which video program would be evaluated from among the titles that had not been previously reviewed by the four original TIC projects, titles evaluated at CalMEP sites, programs produced after 1984, and single-focus titles and selected programs from ITV series.
5. Train the staff members of the satellite evaluation sites in selecting and training the evaluators, the preview criteria, use of the evaluation form, reporting data to the Clearinghouse, and involving subject matter specialists in the curriculum alignment.
6. Establish evaluation teams at each of the satellite sites representative of all grade levels and subject matter areas.
7. Produce a training video program for use at the Clearinghouse, satellite sites, and other media centers with clips of exemplary programs to model quality analyses and standards of compliance with [the California State Board of Education's *Standards for Evaluation of Instructional Materials with Respect to Social Content*].
8. Publish and distribute three issues of the *California Index of Instructional Video* to media producers, ITV agencies, TEC Centers, and county and district media centers.
9. Create and assess the feasibility of an Instructional Video Clearinghouse database using the CalMEP format.
10. Forward labels with bibliographic information on video programs to satellites to affix to evaluation forms and to be used in administering the program.
11. Train the evaluators in four-hour sessions at the Instructional Video Clearinghouse or at satellite sites.
12. Evaluate and align programs with the curriculum in each subject area over a seventh month period at each of the satellites.
13. Obtain and process evaluation results from each satellite and enter evaluation data into the Clearinghouse database.
14. Present a Clearinghouse progress report at annual conference of CMLEA.
15. Publish and distribute the*Technology in the Curriculum Update* in May 1987 to all schools in the state.
16. Conduct an Instructional Video Clearinghouse Forum to review activities, exchange information about integrating media into the curriculum, elicit feedback on Clearinghouse publications, and assess evaluation criteria, the evaluation process, and forms.
17. Evaluate the efficacy of the Clearinghouse program with input from satellite centers and other agencies involved in the project.

In general, while some of the agencies that took part in the evaluation and alignment processes were no longer in operation, the Instructional Video Clearinghouse used the same model each year in carrying out its activities. Activities planned for the 1990-91 academic year, though, reflect the shifts in program priorities toward recognition of educational applications of emerging technologies and reliance on electronic telecommunications technology. Among the new additions to the annual plan of Clearinghouse activities are the following:

1. Review the new instructional video, videodisc, and computer-interactive videodisc guidelines with at least 200 of the evaluators who served during the 1988-89 and 1989-90 school years.
2. Train 50 educators to be critical evaluators of computer-interactive videodisc programs.
3. Prepare descriptive annotations, based on appropriate state frameworks, for programs rated as "exemplary" and "desirable."
4. Enter the appropriate data from both Clearinghouses onto the California Technology Project's TRIE database.

The emphasis of the Instructional Video Clearinghouse on maintaining partnerships with video producers and software publishers is reflected in the following planned activities for 1990-91:

1. Maintain contacts with commercial and governmental/non-profit instructional video producers.
2. Obtain 2000 instructional video, videodisc, and computer-interactive videodisc programs from producers [for evaluation].
3. Continue to involve producers in editing the technology evaluation guidelines.

V. Program Support Resources

State and Local Support. It is evident, given the fact that the CDE's Office of Educational Technology invited the Stanislaus County Office of Education to establish the Instructional Video Clearinghouse and has supported it with annual contract funds ever since, that the Clearinghouse enjoys a very supportive climate at the state level. In the same way, it is clear that the Stanislaus County Office, with its long history of providing facilities for media evaluation projects, has been and remains highly supportive of educational technology resource programs. More recently, in accepting responsibility to provide administrative support services for the Computer Software Clearinghouse, the Stanislaus County Office of Education has demonstrated a genuine commitment to promoting educational technology. The other seven county offices serving as Instructional Video Clearinghouse evaluation satellites demonstrate similarly high levels of commitment to the support of state educational technology initiatives by providing facilities at very reasonable rates.

VI. Program Support, Resources and Constraints

1. ***Program Budget.*** The CDE has been able to provide consistent support for the Instructional Video Clearinghouse since it was established in 1986. The budgets of support provided by CDE funds and Stanislaus County Office contributions for each fiscal year of operations (and the amount projected for the current year) are as follows:

Fiscal Year	AB803/1470 Grant Amt.	Stanislaus COE Amt.	Eval. Satellite Site Support	Number of Sites	Total Amount
1986-87	$ 247,423	$ 37,200	$ 190,000	8	$ 474,623
1987-88	64,260	36,800	192,800	8	293,860
1988-89	85,000	37,920	169,750	7	292,670
1989-90	90,000	39,510	196,800	8	326,310
1990-91*	110,000	40,620	198,960	8	349,580

(*Requested)

2. ***Cost Benefits.*** No formal efforts to ascertain the cost benefits to the state of the system for operating the Instructional Video Clearinghouse have been made so no precise figures are available that would indicate the level of cost-effectiveness. In 1987-88, the average expenditure for preview evaluation at each satellite site was $23,750 for certificated and certified staffing, supplies, printing, postage, payment for substitutes for teacher evaluators, and travel. This evaluation system provides involvement by teachers who represent the diversity of schools in California and yet yields obvious savings in travel costs, payment for released time for teachers, and the like, over a single evaluation site.

3. ***Leveraging.*** The decentralized system of evaluation satellites also promotes the extension or "leveraging" of educational technology funds by eliciting in-kind contribution of facilities and staff time in each of the outlying sites. In addition, the low level of overhead charged by the county offices of education contributes to the overall efficiency of the program.

4. ***Budgeting Procedure.*** The process of arriving at the annual budget for the Instructional Video Clearinghouse involves negotiations with the CDE, with the advice of the Educational Technology Committee over program priorities, progress with current activities, and projections of available funding, submission of a proposed budget, and adjustments as necessary when funding levels are finally determined. The procedures do not seem to place an undue burden upon the parties involved.

VII. Outcomes

Attainment of Project Objectives. In the four years that the Instructional Video Clearinghouse has been in operation, the Clearinghouse has achieved its objectives consistently and efficiently. In order to continue to accomplish a prodigious number of program evaluations, operate an efficient state-wide network of satellite evaluation sites, and promulgate information about high-quality video programs through a wide variety of channels, the Clearinghouse has worked to streamline its evaluation and dissemination procedures. It has also continued to refine the guidelines and evaluation criteria to reflect recent advances in technology by:

- Reviewing the evaluation criteria and form
- Developing and producing a video program that trains evaluators to use the instructional quality analysis portion of the Clearinghouse Preview Evaluation Form

Electronic Outreach. In addition, working in tandem over the past two years (89-90), the Instructional Video and Software Clearinghouses have conducted feasibility studies on using telecommunications to deliver information about video and software evaluation and curriculum mapping. They have explored alternatives for putting Clearinghouse services on-line in an

electronic database, the TRIE database in the CSUNet, and are presently engaged in loading data into that system for a full-scale evaluation. This has involved the following steps:

- Developing a template for combining the existing instructional video and computer software TIC evaluations into one database file
- Verification of the curricular match for all programs in the TIC resource guides
- Entering the TIC evaluation information into the database
- Training personnel from county and district media centers, CDE consultants, and the ITV agencies to access the database

Curriculum Alignment. The release of new curriculum frameworks in science and history-social science has necessitated the realignment of the previous TIC evaluations. This involved:

- Identifying older materials to be deleted from the database
- Retaining materials that are still suitable for each curricular area

A project planned in cooperation with appropriate state curriculum projects and the various CDE curriculum units, will see the development of eight lesson plans that model the effective integration of technology resources across the curriculum. Two plans each will be developed for grades K-3, 4-6, 7-8, 9-12 — one plan each in history-social science and in science, with an effort to integrate language arts and visual and performing arts technology resources when possible. These plans will be accessible to educators on TRIE and will be available to the CTP for TLA training and to CUE and CMLEA for distribution to their memberships.

Accommodating New Technologies. The Software and Instructional Video Clearinghouses have cooperated also in developing evaluation criteria for educational programs utilizing videodisc, CD-R0M, and computer-interactive videodisc systems. These tasks have involved:

- Examining evaluation criteria currently in use in California and other states to develop criteria compatible with California's guidelines for software and video
- Conducting forums for developing the evaluation instruments
- Creating draft versions of the evaluation instruments for review and pilot testing
- Evaluating the use of the evaluation forms
- Revising and releasing the forms for use in actual evaluation settings
- Achieving uniformity in evaluation criteria for all technology resources, including instructional design, content, interest, curriculum match, and technical quality

Staff Development Video and Teleconference. The Instructional Video and Software Clearinghouses are collaborating in the production and dissemination of a ten-minute video program intended to:

- Illustrate the effective use of technology resources to develop higher order thinking skills
- Model the partnership approach for librarians/teachers/computer teachers at the school level and media/librarian/computer/curriculum coordinators at the county and district levels
- Demonstrate effective integration of technology resources in the curriculum
- Illustrate effective uses of on-line resources (TRIE) in curriculum planning

To lay the groundwork for implementation of educational technology programs using new and emerging technologies the two clearinghouses are planning production of a one-hour interactive

teleconference to train county and district media/library/personnel and computer coordinators who will be conducting future training sessions on the use of the new technology resources guidelines, with an emphasis being placed on the evaluation of computer-interactive videodisc programs. The teleconference will:

- Focus on the evaluation of instructional design elements common to all "exemplary" technology resources with an emphasis on selecting those that are the most appropriate for implementing the state curriculum frameworks
- Train educators to use the new technology guidelines for evaluating and selecting computer-interactive videodisc, videodisc, computer software, CD-ROM, and instructional video programs
- Highlight TRIE as a source of evaluative data

VIII. Current Status

The Instructional Video Clearinghouse was reauthorized under AB 1470. The functions and features of the Clearinghouse have not changed significantly since its inception.

IX. Strengths/Facilitating Factors

- The Clearinghouses are the only agencies that evaluate new programs promptly and re-evaluate old programs to reflect the state's continuously changing curriculum frameworks.
- The Clearinghouses carefully coordinate activities to ensure uniformity of evaluation guidelines and to avoid duplication of effort.
- Those who use the Clearinghouse resources report that they save time and effort in searching for exemplary programs.

X. Weaknesses/Constraints

- The "visibility" of the Clearinghouses among classroom teachers is low; the TRIE database and the publications of the software and video clearinghouses do not come to the attention of many educators other than instructional media specialists.
- The level, type, and frequency of use of the Clearinghouses has not been assessed.

XI. Recommendations/Promising Practices

- More detailed information on classroom applications and the curriculum content of programs is needed in the TRIE database entries.
- CSUNet needs to be made more "user friendly" and additional local access numbers (or a state-wide toll-free 800 number) are needed.
- The *Guidelines for Computer Software and Instructional Video* should be revised more frequently to keep up with changes in video technology and curriculum standards.
- A state-wide survey of the level of use by educators of the Computer Software and Instructional Video Clearinghouses needs to be conducted.
- The CDE should continue to provide funding to operate the California Instructional Video and Computer Software Clearinghouses.

Programs such as the Subject Matter Projects, SB 1882 Staff Development Consortia, the CTP regional consortia, and ITV agencies should be better coordinated with the Clearinghouses and used to increase awareness of Clearinghouse services.

California Computer Software Clearinghouse

I. Background

Program History. For all practical purposes, the California Computer Software Clearinghouse had its beginning in 1982 as the Teacher Education and Computer Centers (TECC) Software Library and Clearinghouse. The original collection of educational software had been a part of the Professional Library at the San Mateo County Office of Education, one of the pioneer agencies in educational technology. Until 1987, the TECC Software Clearinghouse operated under the supervision of the Office of Staff Development of the California Department of Education (CDE), when administrative responsibility shifted to the Office of Educational Technology. During each of the early evolutionary stages, the Clearinghouse was located in Redwood City at the San Mateo County Office of Education.

The shift occurred because, in the summer of 1987, the Governor vetoed several CDE programs, including all TECC funds. The state-wide network of 17 TEC Centers was discontinued and the TECC Software Library and Clearinghouse left without funds. The San Mateo County Office of Education, however, provided major support in keeping the Clearinghouse operating, and it was reorganized as the California Computer Software Clearinghouse. The other sixteen county offices then operating TECCs each volunteered to provide $2,000 to the San Mateo County Office to support Clearinghouse operations until continuation funding could be channeled through the Office of Educational Technology. Finally, the TECC Software Preview Collections were reorganized as Software Resource Centers.

Funding to continue operations of the Software Clearinghouse at the San Mateo County Office was subsequently provided from Assembly Bill 803 funds through the Office of Educational Technology. The Clearinghouse has been funded each year since, and operations have been continued under the current educational technology legislation, AB 1470.

In 1989, the Software Clearinghouse offices and educational software collection were moved to California State University, Long Beach, while fiscal control and administrative support were assumed by the Stanislaus County Office of Education in Modesto. Known since the move under its present title, the Software Clearinghouse operates in conjunction with the California Instructional Video Clearinghouse, also located at the Stanislaus County Office and the subject of another section in this report.

Legislative Authority. As described above, the California Computer Software Clearinghouse originally provided support services to the TECC program which was administered by the CDE's Office of Staff Development. Between 1984 and 1987, though, nearly $2.2 million of AB 803 funds, administered by the Office of Educational Technology, were allocated among the individual TEC Centers to support specific activities associated with the Educational Technology Local Assistance Program. A major part of the CDE's strategy to provide regional support services to educational technology programs was the technical assistance grants that the CDE made to the TEC Centers to provide information and planning assistance to schools and districts applying for AB 803 expansion/adoption grants. In turn, as part of their support activities, the TEC Centers promoted learning resource management practices, including utilization of the technology resource materials produced by the Technology in the Curriculum (TIC) Project, another AB 803 initiative.

The first four projects in the TIC program, funded in 1985, had been established to develop technology information resource materials in science, mathematics, history-social science, and

language arts. Two additional TIC projects, in foreign languages and fine arts, were funded in 1986. When the six subject matter TIC projects had completed the evaluations and published the resource guides, the Office of Educational Technology was faced with the problem of updating and revising the materials. As summarized in the *Sunset Report for AB 803* (Office of Educational Technology, March 1987), the situation required prompt attention:

> *In order for the TIC Resource Guides to remain a valuable resource, however, the information in them must be updated on a regular basis. Each year hundreds of computer and video programs are released that have potential applications in California curriculum. To review these newly released programs for quality and match to curriculum, $200,000 in Assembly Bill 803 funds have been allocated to each of two agencies. The San Mateo County Office of Education Software Library and Clearinghouse has had extensive experience in computer software evaluation and will provide, with assistance from the Curriculum Implementation Centers (CICs), quality reviews and curriculum match analyses in the subject areas of the first four TIC projects. The Stanislaus County Office of Education Media Center will provide a similar service for video materials. The two agencies will prepare jointly a TIC Update Guide, which will be distributed to all schools in the state in 1987.*

Thus, the Software Clearinghouse, and the newly established California Instructional Video Clearinghouse, were funded in fiscal year 1986 to update and expand the work of the TIC projects in evaluating and distributing information about video and computer programs that would serve as tools for teaching subject matter content.

Administration. Administrative support is provided for the Software Clearinghouse by the Stanislaus County Office of Education (which also serves as the fiscal agent for the project) under the supervision of the CDE's Office of Educational Technology. The Clearinghouse has established a network of regional Software Resource Centers to provide direct service to educators throughout the state; currently, in addition to the Resource Center located at the Clearinghouse at CSU, Long Beach, there are regional centers located at:

1. Sonoma County Office of Education
2. Tehama County Department of Education
3. Marin County Office of Education
4. San Juan Unified School District
5. San Francisco Unified School District
6. Alameda County Office of Education
7. Stanislaus County Office of Education
8. Santa Clara County Office of Education
9. Cal Poly, San Luis Obispo; Center for Teacher Education
10. Fresno County Office of Education
11. Kern County Superintendent of Schools Office
12. Los Angeles Unified School District
13. Riverside County Office of Education
14. Orange County Department of Education
15. San Diego County Office of Education
16. Monterey County Office of Education

II. Planning

Software Clearinghouse Planning Priorities. The annual plan of the Software Clearinghouse is in the form of a proposal to the CDE to continue funding. The Director of the Clearinghouse conducts an annual survey of the coordinators of the Software Resource Centers to assess regional needs, to collect feedback on current operations, and to solicit suggestions for Clearinghouse objectives for the coming year. Annual plans are now coordinated through the Stanislaus County Office of Education.

Program Governance. The Director of the California Computer Software Clearinghouse oversees the day-to-day operations of the agency from offices in Long Beach and receives administrative support from the Stanislaus County Office of Education in Modesto. One of the

consultants of the Office of Educational Technology is assigned to serve as project monitor and provides oversight for the CDE.

The directors of the 17 Software Resource Centers act as an informal policy board for the Software Clearinghouse. Meetings are scheduled at the biannual meetings of Computer Using Educators, Inc., and the annual conference of the California Media and Library Educators Association.

III. Program Development

Software Clearinghouse Objectives. Specific objectives for the Software Clearinghouse are established each year revolving around the long-established goals of coordinating the evaluation of computer software and (more recently) CD-ROM programs, operation of the regional network of Software Resource Centers, and (until 1989) publishing annual editions of *The Educational Software Preview Guide*. The evaluation of software programs that make use of newer technologies, such as computer-interactive videodiscs, is conducted cooperatively with the Instructional Video Clearinghouse.

The objectives of the Software Clearinghouse for fiscal year 1988-89, the last year that AB 803 funds were granted, will serve to illustrate the range of activities undertaken. The activities of the Software Clearinghouse may be arrayed in several — frequently overlapping — categories of activities, including Curriculum (**C**), Staff development (**S**), Learning resources management (**L**), Dissemination (**D**), and Evaluation (**E**) as indicated in Table 2 below.

Table 2. 1988-89 Software Clearinghouse Objectives

Objectives	C	S	L	D	E
1. Review evaluation process with each of the directors of the Software Resource Centers. Streamline the process to maximize efficiency.			X		X
2. Update the training of the evaluators who served during the 1986-87 and the 1987-88 school years.	X	X		X	X
3. Train 30 additional teachers to serve as critical computer software evaluators.	X	X		X	X
4. Monitor and evaluate the activities of the Clearinghouse's seventeen Software Resource Centers.		X	X		X
5. Complete evaluations for 100 titles in Mathematics and Visual and Performing Arts	X				X
6. Align the Exemplary and Desirable programs with state curriculum frameworks in the six Technology in the Curriculum (TIC) areas.	X		X		X
7. Collect and disseminate analytical evaluations of computer software programming to media center personnel and producers.			X	X	X
8. Publish *The 1988-89 Educational Software Preview Guide*.			X	X	X
9. Verify the curricular match for 500 titles and enter the information into the database.	X		X	X	X
10. Design and implement a pilot electronic retrieval system to enable the Los Angeles, Kern, Alameda, and Shasta County Offices of Education to access the evaluation database via an 800 number			X	X	
11. Maintain contacts with commercial and governmental/non-profit computer software producers.				X	X

Program Components. As one of California's major educational technology support projects, the Software Clearinghouse provides services that complement and extend the impact of other

CDE school improvement initiatives. Of necessity, this involves staff members of both the Software Clearinghouse and Software Resource Centers in a complex set of relationships with other educational technology programs, other CDE units, various educational organizations and agencies, and industry representatives. These include:

Subject Matter Projects
Association of State Technology Using Teacher Educators (ASTUTE)
Regional Staff Development Agencies (SB 1882)
California Media and Library Education Association (CMLEA)
California Technology Project (CTP)
Computer Using Educators (CUE)
Information Power Task Force (CMLEA)
International Society for Technology in Education (ISTE)
Software Publishers Association (SPA)

Continuing interaction between the Software Clearinghouse and the more than 200 members of the Software Publishers Association about new instructional software and CD-ROM programs is maintained through meetings at conferences, regular mailings, and telephone/electronic mail contacts. Selected SPA members have been invited to participate in periodic revisions of the computer software evaluation guidelines.

Program Emphases. The Software Clearinghouse addresses the general reform elements emphasized by all CDE educational technology programs; these include:

1. ***Curriculum.*** When the Software Clearinghouse came under administrative control of the Office of Educational Technology, it was charged with continuing the efforts of the TIC Project to increase the use of high quality educational technology programs in California schools. Toward this end, the Software Clearinghouse has worked to update and expand the information materials produced by the original TIC projects in history-social science, English-language arts, science, mathematics, foreign language, and visual and performing arts. Ongoing activities include the identification of instructional software and CD-ROM programs that support the themes and concepts which are defined in each of the California Curriculum Frameworks.

2. ***Staff Development.*** The delivery of staff development in the effective use of computer software was originally a function of the TEC Centers and the TECC Software Clearinghouse was established to serve that regional network. It did not provide staff development directly to teachers but operated in a trainer-of-trainers mode. An annual TECC Software Forum provided state-wide training in new technologies and curriculum integration of instructional technology. More recently, the California Technology Project (CTP) has been charged with providing staff development programs through its network of regional CTP Consortia, and the Software Clearinghouse works cooperatively with the CTP.

   At present, although the Director of the Software Clearinghouse makes presentations about evaluation of new instructional technologies at educational technology conferences such as CUE and CMLEA, the Software Clearinghouse does not provide any direct professional development services to schools. Its major contribution has been to train a cadre of California educators to evaluate new technology resources using criteria for instructional design, content, curricular match, and technical quality and to identify potential classroom applications for specific grade levels. In addition, the Software Clearinghouse contributes to professional development more broadly through the preparation and dissemination of informational materials on computer software programs for other staff development specialists to use in field programs.

3. ***Learning Resources Management.*** The involvement of the Software Clearinghouse in learning resources management is, as with staff development activities, similarly indirect. The resource materials on computer software, both in print and on computer discs, that are produced by the Clearinghouse serve as tools for increasing the effective use of other types of learning resources in the hands of educators in the schools.

4. ***Dissemination.*** Always one of the major responsibilities of the Software Clearinghouse, the development and dissemination of resource materials about instructional computer software programs that support the California curriculum remains a major priority. Until 1989, the Software Clearninghous produced printed documents and software consumer guides. In 1989, a pilot test of the California Online Database of Instructional Video and Computer Software Evaluations was completed to test the feasibility of using electronic media to augment or possibly replace print media. The findings of the pilot test were used in planning the Technology Resources in Education (TRIE) database that has been developed and is being field-tested in the telecommunications system of the California State University System, the CSUNet.

   The CSUNet may be accessed by teachers at all 20 campuses of the CSU system, generally through a local telephone call or reasonably priced toll call. It is anticipated that the TRIE database will serve as the primary dissemination vehicle for both the Instructional Video and Computer Software Clearinghouses.

   Another, often unnoticed, outreach function of the Clearinghouses lies in the communications they maintain with their main "clients," educators throughout the state of California. Staff personnel of the Software Clearinghouse spend a great deal of time each day answering inquiries about computer software from teachers and software publishers, many referred by CDE personnel, on the telephone, through the mail, and online. The Software Clearinghouse continues to be funded with the provisions of AB 1470 (Statutes of 1989, Chapter 1334)

5. ***Evaluation.*** Paralleling the major responsibility for disseminating information about the resources of the Software Clearinghouse, is the evaluation of computer software programming, the first step in the process. The system of field-based evaluation established by the Software Clearinghouse has expert teachers who are experienced in using educational technology with students and knowledgeable about subject matter curriculum evaluate the quality of new computer software programs. The evaluation procedures are described in detail in the following section.

   More recently, the Clearinghouse has expanded the scope of its evaluation to include CD-ROM programs and computer-interactive videodisc programs, the latter accomplished in a cooperative effort with the Instructional Video Clearinghouse.

IV. Program Implementation

Clearinghouse Activities. When the Software Clearinghouse undertook the tasks of updating and extending the work of the TIC Projects, different procedures were established for evaluating computer software and for disseminating information about high-quality programs than had been used by the four original TIC projects. They had used teams of teachers working in summer project settings to examine software programs against the criteria that had been formulated by each of the projects and the *Guidelines for Computer Software in California Schools*.

The Director of the Software Clearinghouse entered into subcontracts with several consultants in educational technology to set up a field-based evaluation system. The Evaluation Coordinators, all former teachers with many years of experience in the development and evaluation of various types of educational technology, selected a panel of approximately 50 classroom teachers who were experienced in using and evaluating technology materials to conduct evaluation trials of software programs with students in their own classrooms. Many of the original evaluation panel teachers had taken part in the TIC projects in previous year. The current evaluation panel includes educators in the various Subject Matter Projects. All evaluation panel members, though, receive additional training in software evaluation from the Evaluation Coordinators.

The current procedures for evaluating computer software programs include the following steps:

1. The Clearinghouse Director sends letters requesting preview copies of new programs to approximately 300 software publishers. Evaluation guidelines and legal compliance criteria are provided in the request letters.
2. The Director screens all programs received from publishers against a set of basic "Essential" criteria for use in California schools.
3. Software programs that meet the standards of "Essential" criteria are sent to the Evaluation Coordinator for field evaluation.
4. The Evaluation Coordinator selects a teacher at the appropriate elementary grade level and/or of the appropriate secondary subject area and sends the software program to the teacher.
5. The teacher evaluator tries the software program with students and assesses it against the criteria specified in the *1991 Guidelines for Computer Software in California Schools* and the *Standards for Evaluation of Instructional Materials with Respect to Social Content* issued by the California State Board of Education.
6. If the teacher evaluator judges that the software program does not meet the standards for classification as "Desirable" or "Exemplary," the program is returned to the Evaluation Coordinator for additional review. If the Coordinator concurs with the teacher evaluator, the program is returned to the Clearinghouse and is listed only by title as *evaluated but did not meet criteria for "Desirable" or "Exemplary" rating*. If, however, the Coordinator believes that the program deserves additional evaluation, it may be sent to a second teacher evaluator for additional classroom evaluation.
7. If the teacher evaluator reports that the software program does meet the standards for classification as either "Desirable" or "Exemplary," the Evaluation Coordinator sends it to one or two other teachers for additional verification.
8. The Clearinghouse Director or the Evaluation Coordinator prepares descriptive annotations for programs that are rated as "Exemplary" or "Desirable." The descriptions of software programs judged to the "Desirable" or "Exemplary" were published in the *TIC Resource Guide Updates* of 1987 or 1988, and then, until 1989, in annual editions of *The Educational Software Preview Guide*. The evaluations and descriptions are now available state-wide in the TRIE database.
9. The Director also sends results of all evaluations to publishers and communicates with them about the results, generally by telephone, to ensure that California's evaluation guidelines are clearly understood. The publishers are encouraged to develop the kinds of high quality software that will meet the needs of California students.
10. The Clearinghouse Director contacts each publisher of a program rated "Desirable" or "Exemplary" and requests 17 copies for the Software Resource Centers.

Activities proposed for 1991 provide an overview of the overall scope of Software Clearinghouse activities. It is anticipated that the Software Clearinghouse will:

1. Expand the information resources base

   a. Train an additional 30 to 40 educators to evaluate computer software programs and update the training for the fifty educators currently evaluating software.
   b. Train 10 to 20 educators to evaluate CD-ROM programs.
   c. Evaluate a minimum of 250 software programs and 20 CD-ROM programs in history-social science, science, language arts, and mathematics.
   d. Prepare for TRIE selected and appropriate evaluation data on programs published in *The 1991-92 Educational Software Preview Guide.* California is a participant in this national project. The feasibility of entering data from student evaluation projects and/or maintaining an open file for educators to enter their own evaluations will be explored.

2. Expand/maintain database services

   a. Prepare descriptive annotations, based on appropriate state frameworks, for programs rated as "Exemplary" and "Desirable."
   b. Deliver the annotations to the Instructional Video Clearinghouse and assist with data entry into the TRIE database.

3. Maintain industry partnerships

   a. Contact at least 200-300 publishers to secure computer software and CD-ROM programs for the 1991 TIC evaluation project.
   b. Contact at least 200-300 publishers to secure new preview software and CD-ROM programs for the 17 Software Resource Centers.
   c. Continue to involve publishers in updating the evaluation guidelines for CD-ROM and computer software programs.

4. Maintain and expand partnerships with state/county/regional service units

   a. Explore ways to provide software preview and evaluation services to the regional CTP consortia.
   b. Coordinate Software Clearinghouse activities, as appropriate, with state curriculum projects, SB 1882 regional consortia, and the curriculum units of CDE.
   c. Meet with representatives of 17 Software Resource Centers at meetings such as CUE, and CMLEA.
   d. Meet with ASTUTE twice a year to explore ways to make the software preview and evaluation services more accessible to teacher training programs.
   e. Represent California on the National Educational Software Evaluation Consortium and attend one annual meeting to develop *The 1991-92 Educational Software Guide.*

V. Program Support Resources

State and Local Support. Since it came under the admistration of the Office of Educational Technology in 1987, the climate of support at the state level for the Software Clearinghouse, as is evident in the review of the history above, has been consistently high. The CDE has valued the contributions of the Software Clearinghouse to the entire educational reform effort to the extent

that, even in the face of severe budgetary restrictions, resources have been allocated to keep the program going.

There have been some shifts, though, in the support for continuing the Software Clearinghouse among some county offices of education, particularly the office that served for many years as the host agency, the San Mateo County Office of Education. When changes in county office leadership and shifts in interest toward the level of support for educational technology programs brought about a reduction in resources allocated for educational resources in general, and educational technology support programs in particular, it became expeditious for the Software Clearinghouse to relocate. Similarly, four of the county offices that had previously been TEC Center sites and had become Software Resource Centers when TECC funding ended, have withdrawn as hosts of Software Resource Centers. The Software Clearinghouse Director reports that successful efforts have been made to direct shifts in Center locations to other county offices or to teacher education departments at institutions of higher education, as was the case with the recent move to Cal Poly, San Luis Obispo, of the Center previously located at the Santa Barbara County Office of Education.

The current arrangements, with offices for the Clearinghouse Director and staff provided at CSU, Long Beach, and administrative support provided by the Stanislaus County Office, are reported to be satisfactory to all of the parties involved. The Graduate School of Education at CSU Long Beach provides office space, laboratory space, and a Graduate Assistant for the project.

VI. Program Funding Resources and Constraints

1. ***Program Budget.*** The CDE has been able to provide a fairly consistent level of support for the Software Clearinghouse since it came under the administrative authority of the Office of Educational Technology in 1987. Since fiscal year 1986-87, when the CDE grant included support to print and distribute resource guides, the amounts of support provided by either AB 803 or AB 1470 funds contributions provided by county offices of education for each fiscal year of operations (and the amount requested for the current year) are as follows:

Fiscal Year	AB 803/1470 Amount	County Office Amount	Total Amount
1986-87	$200,000		$200,000
1987-88	65,000	$ 20,000	85,000
1988-89	85,000		85,000
1989-90	86,000		86,000
1990-91	77,080 (requested)		77,080

2. ***Cost Benefits.*** There have not been any formal efforts to ascertain the cost benefits to the state for operating the Software Clearinghouse; therefore, precise figures are not available that would indicate the degree of cost-effectiveness.

3. ***Leveraging.*** The field-based system of evaluating computer software promotes the extension or "leveraging" of educational technology funds by eliciting in-kind contribution of facilities and staff time in each of the evaluation sites. Beyond the modest stipends paid to the teacher evaluators for their contributions there are few additional costs since no released time is required and payment for substitutes is not necessary.

   In addition, the lack of any contract charges or other fees paid to the county offices of education serving as Software Resource Centers contribute to the overall efficiency of the program. These sites receive new software on long-term loan from the publishers and, in return, provide hardware, staff, and space for educators to preview the programs. The

total value of the 1,979 software programs placed in the 17 Software Resource Centers to date is $2,104,203.

The prospect of reaching more California educators by disseminating Clearinghouse information through the CSUNet database promises even greater efficiency than past practice of placing primary reliance on print resources.

4. ***Budgeting Procedure.*** The process of arriving at the annual budget for the Software Clearinghouse involves negotiations with the CDE, with the advice of the Educational Technology Committee, over program priorities, progress with current activities, projections of available funding, submission of a proposed budget, and adjustments as necessary when funding levels are finally determined. The procedures do not seem to place an undue burden upon the parties involved and, when submitted and administered in conjunction with the budget for the Instructional Video Clearinghouse, would seem to involve some economies of scale in administrative costs.

VII. Outcomes

Attainment of Project Objectives. In the four years that the Software Clearinghouse has been administered by the Office of Educational Technology, it has achieved its objectives consistently and efficiently. In order to continue to accomplish a prodigious number of program evaluations, operate an efficient state-wide network of Software Resource Centers, and promulgate information about high-quality software programs through a wide variety of channels, the Software Clearinghouse has worked continuously to streamline the evaluation and dissemination procedures. It has also continued to refine the evaluation guidelines and criteria to reflect recent advances in technology This has involved:

- Revising the software evaluation tools to match the new history-social science and science curriculum frameworks and to implement higher standards for instructional software
- Contracting with appropriate experts to coordinate the revision and evaluation activities
- Developing evaluation guidelines and criteria to evaluate CD-ROM, computer-interactive videodisc, and other emerging technologies

The CD-ROM evaluation guidelines being released in June 1991 are the first to be developed for K-12 CD-ROM programs in the United States.

Electronic Outreach. For the past three years, the Directors of the Software and Instructional Video Clearinghouses have conducted a feasibility study about using telecommunications to deliver information on video and software evaluation and curriculum mapping.

The Clearinghouses have also explored alternatives for putting evaluation information on-line in an electronic database, the TRIE database in the CSUNet, and are presently engaged in loading data into that system for a full-scale evaluation. This has involved the following steps:

- Developing a template for combining the existing instructional video and computer software TIC evaluations into one database file
- Verification of the curricular match for all programs in the TIC resource guides
- Deleting obsolete or no-longer published programs from the original 1985 TIC guides
- Entering the TIC evaluation information into the database
- Training personnel from county and district media centers, CDE consultants, and the ITV agencies to access the database

Curriculum Alignment. The release of new California curriculum frameworks in science and history-social science has necessitated the realignment of the previous TIC evaluations with the new frameworks. This has also involved:

- Identifying older materials to be deleted from the database
- Retaining materials that are still suitable for each curricular area

A project planned in cooperation with appropriate state curriculum projects and the various CDE curriculum units, will involve the development of eight lesson plans that model the effective integration of technology resources across the curriculum. Two plans each will be developed for grades K-3, 4-6, 7-8, 9-12 — one plan in history-social science and one in science for each level, with an effort to integrate language arts and visual and performing arts technology resources when possible. These plans will be accessible to educators on TRIE, will be available at CTP Technology Leadership Academies (TLA), and will be offered to CUE and CMLEA for distribution to their memberships.

Accommodating New Technologies. The Software and Instructional Video Clearinghouses have cooperated also in developing evaluation criteria for educational programs utilizing videodisc, CD-R0M, and computer-interactive videodisc systems. These tasks have involved:

- Examining evaluation criteria currently in use in California and other states to develop criteria compatible with California's guidelines for computer software and instructional video
- Conducting forums for developing the evaluation instruments
- Creating draft versions of the evaluation instruments for review and pilot testing
- Sending draft versions to major publishers for review and feedback
- Evaluating the use of the evaluation forms
- Revising and releasing the forms for use in actual evaluation settings
- Training California educators to use the new evaluation forms

Staff Development Video and Teleconference. The Instructional Video and Software Clearinghouses are collaborating in the production and dissemination of a ten-minute video to:

- Illustrate the effective use of technology resources to develop higher order thinking skills; comparing, contrasting, generalizing, and sequencing
- Demonstrate effective integration of technology resources in the curriculum
- Illustrate effective uses of on-line resources (TRIE) in curriculum planning
- Illustrate effective management of learning resources

To lay the groundwork for implementation of educational technology programs using new and emerging technologies the two Clearinghouses are planning production of a one-hour interactive teleconference. The focus will be on training county and district media/library/personnel and computer coordinators who will be conducting future training sessions on the use of the new technology resources guidelines. Emphasis will be placed on the evaluation of computer-interactive videodisc programs since there is strong interest in this new technology. The teleconference will:

- Focus on the evaluation of instructional design elements common to all "Exemplary" technology resources with an emphasis on selecting those that are the most appropriate for implementing the state curriculum frameworks

- Train educators to use the new technology guidelines for evaluating and selecting computer-interactive videodisc, videodisc, computer software, CD-ROM, and instructional video programs
- Highlight TRIE as a source of evaluative data

VIII. Current Status

The Software Clearinghouse was reauthorized under AB 1470 (Statutes of 1989, Chapter 1334). The functions and features of the Clearinghouse have not changed significantly since its inception.

IX. Strengths/Facilitating Factors

- The Clearinghouse are the only agencies that evaluate new programs promptly and re-evaluate old programs to reflect the state's continuously changing curriculum frameworks.
- The Clearinghouse carefully coordinate activities to ensure uniformity of evaluation guidelines and to avoid duplication of effort.
- Those who use the Clearinghouse resources report that they save time and effort in searching for exemplary programs.

X. Weaknesses/Constraints

- The "visibility" of the Clearinghouse among classroom teachers is low; the TRIE database and the publications of the Software and Video Clearinghouses do not come to the attention of many educators other than instructional media specialists.
- The level, type, and frequency of use of the Clearinghouse has not been assessed.

XI. Recommendations/Promising Practices

- More detailed information on classroom applications and the curriculum content of programs is needed in the TRIE database entries.
- CSUNet needs to be made more "user friendly" and additional local access numbers (or a state-wide toll-free 800 number) are needed.
- The *Guidelines for Computer Software and Instructional Video* should be revised more frequently to keep up with changes in video technology and curriculum standards.
- A state-wide survey of the level of use by educators of the Computer Software and Instructional Video Clearinghouses needs to be conducted.
- The CDE should continue to provide funding to operate the California Instructional Video and Computer Software Clearinghouses.
- Application tools, such as word processing software and spreadsheets, should be reviewed in addition to stand-alone educational software and examples for integrating applications with the curriculum should be provided.
- The curriculum programs of integrated learning systems (ILS) should be reviewed using the software and video Clearinghouse criteria for alignment with the California curriculum frameworks.

- Programs such as the Subject Matter Projects, SB 1882 Staff Development Consortia, the CTP regional consortia, and ITV agencies should be better coordinated with the Clearinghouses and used to increase awareness of Clearinghouse services.

Teaching Videotape Pilot Program

I. Background Information

Program Description. The Teaching Videotape Pilot Program (TVPP) was created by Senate Bill 2130 (Seymore). This bill established a fund of $275,000 for the creation of a pilot program to create teacher-produced instructional video programs for classroom use. Out of this funding, $25,000 was allocated for the management of the program and a request for proposals (RFP) was developed by the Office of Educational Technology at the California Department of Education (CDE, 1987e). The $25,000 grant for the management of the program was awarded to the Sacramento Educational Cable Consortium (SECC) in a competitive bid process. The SECC is a non-profit multi-district consortium that serves all public and private schools in the Sacramento area. The San Juan School District, which serves northeast Sacramento County also participated in the project. The TVPP involved 34 high school teachers over a one and one-half year period of time, beginning in September 1987. The districts involved in the project received funding directly from the state. These districts were carefully chosen to represent a cross section of the population of Sacramento County.

Legislative Authority. SB 2130 states: "The purpose of the project is to determine the effectiveness of combining videotapes of instruction conducted by a teacher with the instructional materials ordinarily used by that teacher in the subject matter in improving the quality of classroom instruction." The bill further states that the video instruction should supplement, not replace, conventional instruction, and that the instructional effectiveness and cost-benefits of the project should be systematically evaluated by an independent agency.

II. Program Development

Objectives. The goals and objectives of the TVPP were clearly defined in the original proposal (Sacramento Educational Cable Consortium, 1989). Approximately 33 teachers were to be selected from six participating school districts and then trained in video production and curriculum integration. Teachers were to propose and then develop and test their own instructional video programs in the classroom. Once tested, the programs were to be aired on SECC's educational cable television station, Cable 30. The Research and Evaluation Department of the San Juan School Unified District was to conduct an independent evaluation of the video programs.

III. Program Operations

Components. While the TVPP was focused upon a specific set of objectives, it also addressed some more general elements of educational technology programs; these included:

1. ***Curriculum.*** Thirty-four teachers were chosen to develop programs in five major curriculum areas. The districts chose teachers based on participation in exemplary curriculum programs and interest in instructional television. Most programs were developed for use at the high school and/or middle school level. The programs ranged in length from ten minutes to one hour. Some programs were divided into two or more parts, placed on individual videotapes. Table 3 on the following page lists the number of programs and videotapes produced for each of the five curriculum areas.

Curriculum Area	Number of Programs	Number of Videotapes
English-Language Arts	9	24
History-Social Science	25	35
Math-Computer Science	13	16
Science	24	34
Economics	9	11

Teachers were required to carefully plan the curriculum content of the video programs so that they could easily be integrated with normal classroom instruction. Lesson plans were created to facilitate the use of the videos.

2. ***Staff Development.*** The participating teachers received a great deal of staff development and technical assistance throughout the implementation of the project. After the teachers were selected to participate in the project, they participated in a general project orientation meeting. Teachers were informed of the project goals and told what was expected of them. The participants received a $1000 stipend after attending the orientation. The stipends were intended to compensate for the extra time that the teachers would be required to spend attending staff development sessions and producing their videos. After the orientation, teachers were required to complete an 18 hour course in instructional video production conducted by the Los Rios Community College District. An additional $1000 stipend and college credit were given to teachers who completed the course. All project teachers participated in the course and received passing grades. The course was designed to be concurrent with the actual video production. An additional course, attended by fifteen teachers, was offered in video editing. A guide to producing student tests was developed and distributed to each teacher. This handbook outlined the student assessment procedures, along with steps in developing tests to cover the material contained in the videos.

3. ***Learning Resources Management.*** Project implementation was planned so that the existing resources of SECC would be used effectively and so that portions of the project would continue after the end of the funding period. Staff and facilities at the California State University, Sacramento, and the Los Rios Community College District were heavily utilized by the project. Both colleges provided staff development, technical assistance, and video editing facilities to the project teachers. The participating districts provided varying levels of support to the project. Part of the project funding was used to purchase video filming and editing equipment for the SECC office. Teachers could use this equipment on a first-come, first-served basis while producing their videos. Each teacher also received a $1000 grant to purchase video equipment of their choice for the classroom. The director of SECC was responsible for coordinating all of the resources available to the project.

4. ***Dissemination.*** Dissemination was a major component of the original project plan. At the time of the project, 75% of the schools in Sacramento County were able to receive cable Channel 30, which is operated by SECC. All schools are now able to receive this channel. Cable 30 served as the primary means of distributing the video programs to the schools in the area. It was used to "block feed" the programs in each curriculum area so that schools could easily tape them for convenient use. The TVPP programs were also given a regular time slot on Channel 30. Guides describing the programs were sent to each school in Sacramento. Flyers, newspaper and newsletter articles, and an on-the-air educational bulletin board were also used to market the programs. For dissemination beyond the Sacramento area, catalogs describing the TVPP programs were sent to all regional media service agencies in California. Copies of all of the videotapes are

available from the media services unit of the Sacramento County Office of Education. The video equipment purchased with project funds remains available to teachers in the future. Almost all of the teachers (97%) stated that they would continue to produce instructional videotapes, and over half will seek additional funding for this purpose.

5. ***Evaluation Plan.*** A systematic independent evaluation of the TVPP was mandated by SB 2130 and conducted by the Research and Evaluation Department of the San Juan School District. Teachers were surveyed and interviewed through the implementation of the project and students were tested for mastery of skills taught in the videos. As part of the formative evaluation, teachers completed surveys after each staff development activity to rate its effectiveness. The results were used to plan further activities. The implementation of the project was monitored in terms of the original timeline for the completion of the objectives. To determine teacher reactions to the project, three surveys and a telephone interview were conducted over the course of the project. The intent of these surveys was to gather information about the development of the videotapes, the use of the programs in the classroom, student responses to this instruction, and teacher response to their involvement in this pilot project. Approximately 200 students in 16 classes were also surveyed for reactions to the videotapes. A teacher-developed program-specific post-test was also given to the students who had seen the video tapes. The same tests were also given to control groups of similar students who had not seen the programs.

IV. Program Implementation

The original project plan was closely followed throughout the implementation of the project (Sacramento Educational Cable Consortium, 1989). All of the objectives were at least partially met. Teachers were successfully trained in the use of video production equipment, they created useful and interesting videotapes, the videos were successfully disseminated through the use of Cable Channel 30, and an evaluation was conducted and the results reported to the CDE. Formative assessment surveys and interviews were used to monitor the progress of the project. It was found that the production of the programs took considerably longer than was expected, so many of the timelines for production related objectives were not met by all teachers. Progress was also impeded slightly by three teachers dropping out of the project and being replaced with new teachers unfamiliar with the objectives and expectations. It was also found that more training was needed than was anticipated, especially in video editing and graphics.

V. Resources to Support the Program

Context Support. There was a great deal of community support and involvement in the production of the TVPP programs. A local TV station and newspaper helped to produce behind-the-scenes programs about news reporting. In some other programs, local writers, artists, experts on history, science and literature, other members of the community were interviewed. Several museums, the Sacramento City Police, the Smithsonian Institution, the Sacramento AIDS Foundation, the American Red Cross, the Sacramento Water Department, and a variety of other local, regional and national groups contributed to many of the videos. Dissemination of the programs was supported by the community as well — two articles promoting the TVPP video programs were printed in a local newspaper. According to the projects evaluation reported, the varied support was received from the six participating districts.

Adequacy of Resources. SECC served as the main staff development and equipment resource for the project. Its cable television station provided an exceptionally valuable resource to the TVPP project. Without Cable Channel 30, the programs would have been much more difficult to advertise and distribute. SECC provided the space for project operations and project-purchased

equipment. The equipment included a complete 3/4 inch video editing studio, a character generator, portable cameras and recording equipment, lighting, and a variety of accessories. SECC staff involved with the project included: the project director, one of the technical assistants, the promotion and graphics coordinator, and the clerical staff. Additional technical assistance was provided by Los Rios Community College and outside consultants. Both Los Rios and California State University, Sacramento provided staff development and production facilities to the project. The participating teachers were also able to buy a limited amount of equipment for classroom use, such as VCRs, camcorders and monitors.

VI. Program Funding Resources and Constraints

1. ***Project Budget.*** The goals of the project were completed within the original budget. A variety of in-kind services were provided by SECC, Los Rios Community College, and several local businesses and foundations.

2. ***Cost Benefits.*** Among the benefits reported were: 125 quality instructional videotapes were produced at an average cost of $1,800 per tape, video production equipment purchased for the project continues to be available to teachers, programs are available to educators throughout the state, and the teachers trained by the project have stated that they will continue to develop videos; many said they would seek additional funding.

3. ***Budget Equity.*** To maintain equity, each teacher involved in the project received the same amount of funding. Although SECC states that its policy is to equally represent all students at all grade levels and abilities in its region, the videos focussed primarily on high school and middle school students. It should be noted that the legislation did not specify that any particular range of grades should be served.

4. ***Budgeting Procedure.*** The budget for the TVPP was divided into two major categories: funding for administration and direct funding to participating districts. SECC received a grant of $25,000 and contributed $1,345 of its own funds for the management and evaluation of the project.

VII. Outcomes:

Eleven project objectives were proposed and evaluated. These objectives included staff development activities, production of instructional videotapes, airing of instructional videotapes on cable Channel 30, and evaluation of the effectiveness of the technology in the classroom. Staff development objectives were attained with an orientation meeting, an 18 hour community college ITV production class, and continued support and direction from SECC producers. Fifteen teachers were provided with additional training in video editing. Objectives related to the production of the instructional videotapes were generally not met according to the proposed timeline. However, 125 tapes were developed and aired on cable Channel 30, thus meeting the overall production objective. An average of 3.7 tapes were produced per teacher.

The objective of completing and reporting the project evaluation was met, with a full report (Sacramento Educational Cable Consortium, 1989) being submitted to the California Educational Technology Committee. After completion of the project, the videotapes were disseminated to county media centers throughout the state. The evaluation produced very favorable results concerning the effectiveness of instructional video. Ninety-four percent of the teachers indicated that the project had enhanced classroom instruction. Ninety-seven percent indicated that they plan to continue developing videotapes, and all of the teachers stated that they would recommend the project to others. Teachers discovered several factors that have a positive impact on the use

of video instruction, including: active participation between students, teacher and videotape program, student involvement in the production of videotapes, proper balance between video and conventional instruction, and correlation of videotape content with the curriculum. Students were assessed with a test measuring the content of the video tapes, but the results were not conclusive. A survey indicated that students felt that the tapes were interesting and easy to comprehend and that additional videotape instruction was desired.

VIII. Current Status

TVPP was a one-time project. No similar projects have been funded.

IX. Strengths/Facilitating Factors

- The TVPP project demonstrated clearly that — given proper training and equipment — teachers could successfully produce high-quality instructional programming to support classroom instruction.
- Information about the TVPP tapes was disseminated to county media centers throughout the state and copies of all of the TVPP programs were available from the IMC of the Sacramento County Office of Education.
- Students were actively involved in the production of the TVPP video programs.
- A variety of local businesses, foundations, and institutions of higher education contributed to the TVPP project.
- The TVPP teachers continued to have access to video production equipment and continued making other programs after the project was completed.

X. Weaknesses/Constraints

- Information about the results of the TVPP project was not adequately disseminated by the CDE; successful aspects of the program could be adopted by other projects or individual schools.
- The evaluation of student outcomes in the TVPP classes was insufficient and follow-up was not conducted to determine if the programs were being used by the county media centers.
- Some teachers withdrew from the TVPP project without producing any tapes after they had already received stipends from the SECC.

XI. Recommendations/Promising Practices

- Teacher-produced videos could be used to support components of the California curriculum frameworks that are not currently addressed by instructional television.
- The CDE should use the various regional support programs (Subject Matter Projects, SB 1882 Staff Development Consortia, the CTP Technology Leadership Academies, etc.) to disseminate information about the TVPP project materials that have been validated.
- The ITV regional agencies should be used to distribute the most effective teacher-produced programs on a state-wide basis.
- In any future project of this type sufficient released time for the teachers should be provided by participating school districts and stipends should not be paid until teachers actually complete at least one video tape.

California Historical Society *On Location* Video Programs

I. Background Information

Program Description. In 1987 the California Department of Eduction (CDE) awarded a grant to the California Historical Society (CHS) to produce a series of television programs with accompanying teacher's guides that would support the fourth grade history-social science curriculum. Production of three of the proposed series of eight programs was completed with matching funds from Assembly Bill 803 before the partnership between the CDE and CHS was ended in 1988. A fourth program in the series was subsequently completed with funds provided from the current Educational Technology Act, Assembly Bill 1470.

Established in 1871, the CHS was subsequently designated by the State Legislature as the official state historical society although no state financial support is provided. The CHS is a state-wide nonprofit institution dedicated to promoting understanding and appreciation of California's history among the state's citizens. The CHS offers a variety of programs and resources including a quarterly magazine, a bimonthly newsletter, major research library facilities, tours of historical sites, and technical service workshops for local history groups.

In 1985, the CHS Board of Trustees decided that the Society should help serve the needs of the state's elementary and secondary schools. Members of the Board personally donated $35,000 toward the establishment of a CHS School Program, a step that led to the development of a proposal for *On Location in California*, an eight program series of videos with print support materials (California Historical Society, 1987). The project was to be operated as a collaborative among the CHS, eight school districts, and local community history groups. Each of the local teams would assist in the production of one program in the series.

Legislative Authority. In the *Sunset Report for Assembly Bill 803*, the Office of Educational Technology of the California Department of Education (CDE) described three "strategies to assist educators with the major task of locating high-quality computer software and video programs and integrating them into the curriculum." These strategies made up the Curriculum Materials Development and Acquisition "initiative" of Assembly Bill 803, and included the TIC Project and the program of long-term licensing agreements with producers of computer software and instructional television series; these are described in other sections of this report. "The third major strategy for curriculum material development, initiated in 1986-87, [was] to enter into partnerships with publishers to produce high-quality computer software and video programming that matches California's curriculum needs." The *On Location* series was supported within the "acquisitions/partnership" thrusts of AB 803 programs.

II. Project Planning

Rationale. The principle objective of the *On Location* video project was to enable the CHS to "become the catalyst in forming local school/history community partnerships that will develop and utilize a series of video/print materials related to specific historic sites." The CHS proposal for *On Location* noted that "the California State Department of Education is particularly concerned about the lack of history instruction at the elementary school level, when children experience their first formal contact with this discipline." In stating a rationale for state funding the CHS proposal observed the following:

Publishers of educational media and software curriculum do not find California history a profitable venture because of limited interest outside the state. This makes it unlikely that elementary level curriculum in California will be created by the commercial publishing industry. As a non-profit institution dedicated to the promotion of California history, we see this as an opportunity for the Society to provide teachers with video programs that satisfy their need for high quality materials and which also fulfill the state's curriculum requirements.

As part of the preparation for the video project, the CHS School Program had conducted an informal review of existing supplementary materials on California history and found that they were either dated, difficult to find, too local in nature for state-wide use, or too advanced for fourth graders. These shortcomings were addressed in developing the operating objectives for the project.

Objectives. The overall goal proposed by the CHS was "to produce a video/print curriculum series" that would expand the "presentation of California history in the elementary grades by focusing on historic sites and drawing upon the resources of local historical organizations and local school districts." The project proposal specified four objectives:

1. *Develop a series of eight* On Location *video/print units. The series will tie unique regional historical sites, and information relating to them, into the following History-Social Science Framework requirements: California: its land and its environment; the history of California and the diverse peoples who made that history; and California's government: past and present. CHS will:*

   - *Collaborate with local school/history organization teams in developing the series.*
   - *Oversee field testing, evaluation, editing, printing and dissemination of the series.*
   - *Advertise and demonstrate the series within the educational community state-wide.*

2. *Expand the perceptions of fourth graders about: (a) their local history, its place in the history of the state, and its similarities to and differences from other regions, and (b) primary historical information sources as tools for sharpening learning skills. CHS will:*

   - *Supervise the selection of primary source documents and the filming of historical site visits to ensure that they foster analysis and critical thinking.*
   - *Ensure that the curriculum packets relate local history to a state-wide context.*
   - *Oversee the state-wide distribution of all On Location packets.*

3. *Encourage teachers to use local history and the resources of historical societies, museums, and organizations as an approach to teaching California history. CHS will:*

   - *Conduct historic site-specific workshops for teachers in eight host districts.*
   - *Create and work with eight local school/history organization curriculum development teams, which will include six teachers per team.*
   - *Demonstrate the series at major museum and educational conferences throughout the state.*

4. *Increase the sensitivity of selected historical organizations to the needs of the classroom teacher for information and resource materials in California history. CHS will:*

   - *In eight locales, bring together historical organization staff with teachers for the express purpose of developing a On Location unit in their community.*
   - *Work with the staffs of selected historical organizations to organize and conduct in-services for teachers in eight school districts.*
   - *Help selected historical organizations review their resources for their usefulness to teachers.*

Proposed Video Programs. The *History-Social Science Framework for California Public Schools* suggests that California history be taught at the fourth grade level, where students are expected to learn the state's major historical periods and the variety of its peoples, government, and environment. The series was to include the following sites, cooperating school districts, and working program titles:

1. Angel Island, San Francisco (San Francisco Unified School District) *San Francisco's Port of Entry and the "Ellis Island of the West"*
2. State Capitol, Sacramento (San Juan Unified School District) *The Capitol, Symbols of Statehood*
3. Old Town and the Presidio, San Diego (San Diego Unified School District) *The Pueblo and Our Hispanic Heritage*
4. Pioneer Village, Bakersfield (McFarland Unified School District) *Black Gold (Oil): Nature's Bonanza*
5. Hollywood, Los Angeles (Los Angeles Unified School District) *Fantasies Come True: The Early Years of the Film Industry in Southern California*

The last three units proposed were still in the conceptual stage at the time that the CHS project proposal was submitted; they included the following:

6. Native American Culture, Northern California
7. Goldrush, Northern Sierra
8. Missions, Southern California; or Agriculture, Central Valley

III. Project Operations

Components. The CHS video project, although it had rather specific objectives, also addressed some of the more general elements of educational technology programs; these included:

1. ***Curriculum.*** As described above, the CHS series programs emphasized several major topics of the History-Social Science Framework; these included (1) California: its land and its environment; (2) the history of California and the diverse peoples who made that history; and (3) California's government: past and present.

   In addition, the project sought to expand the perceptions that fourth graders might have of local history, the place of local history in the larger history of the state, and the similarities and differences among various regions.

2. ***Staff Development.*** The CHS project staff planned to conduct conduct historic site-specific workshops for the teachers in the eight host districts. These workshops were intended to examine both the local historical site that was the subject of the program and how to use the video and print materials to teach the history unit. In addition, the CHS School Program planned to conduct substantial staff development activities in the outreach component of the project, discussed below under dissemination.

3. ***Learning Resources Management.*** Staff personnel of the *On Location* project planned to collaborate with the seven regional Instructional Television (ITV) Agencies, the California Instructional Video Consortium (CIVC) and the county media centers to ensure that schools would have convenient access to the resources developed by the project.

4. ***Dissemination.*** The CHS project employed five strategies to ensure that the *On Location* materials would be used: (a) workshops were conducted in each host district by the teachers and development team, (b) broadcast quality master copies of the programs were distributed to ITV agencies and to all of the county office of education media centers, (c) 1000 copies of the print materials were printed for each of the programs and distributed to county office media centers, (d) the programs were demonstrated at a variety educational conferences, and (e) four major regional workshops were held to demonstrate the series to county media center and educational television personnel.

5. ***Evaluation.*** An outside evaluator was engaged to develop assessment tools and to supervise the evaluation of the video and print materials, the implementation of the project, and staff development activities.

   The curriculum was to be evaluated in terms of: (a) effectiveness in covering state framework content; (b) increase in student understanding of the history of the chosen site; (c) broadening student perception of the differences between different regions of the state; and (d) heightening student understanding of historical documents.

   Team collaboration was to be evaluated in terms of: (a) effectiveness of the process of curriculum development; (b) extent to which teachers became more aware of local history resources; (c) increase in teacher understanding of the use of primary source materials; and the (d) extent to which local history organizations and scholars became more aware of the needs of students and teachers.

   The staff development component was to be evaluated in terms of: (a) usefulness of information presented; (b) extent to which teachers were more likely to use local history resources; and (c) the extent to which teachers integrated the project curriculum into their instructional programs.

IV. Project Implementation

Management. The California Historical Society had established the CHS School Program in 1985 to begin planning and fundraising for a video series. The project Director and Coordinator were veteran teachers with advanced degrees in education and experience in developing both print and video curriculum materials. They were hired with the understanding that the School Program would raise sufficient funding to be self-sufficient and that the *On Location* series would attract grant support from the CDE. Preliminary support for production of the "San Francisco" program, the first of what would become the *On Location* series, was received from the Haas, Jerbode, and San Francisco Foundations. The CHS contracted with a professional video production company, Vox Productions, Inc., to tape the programs, perform the pre- and

post-production technical activities, and prepare broadcast quality video tapes for reproduction and distribution.

Then, in 1986, with production on the first program already underway, discussions about the CHS project were initiated with CDE officials. When they received encouragement from the CDE, the CHS School Program staff decided to undertake research, planning, and writing the formal proposal to the CDE for the *On Location* series.

Advisory Committee. As a result of negotiations with CDE consultants in the Office of Educational Technology on implementation of the grant award, the CHS organized an *On Location* Program Advisory Committee made up of representatives from ITV agencies, county office of education media centers, the History-Social Science Curriculum Implementation Center, and CDE consultants from the Educational Technology and History-Social Science Curriculum units. The Advisory Committee members reviewed and critiqued the scripts and rough video edits of each program in the *On Location* series.

Series Production. As noted earlier, there were three programs completed with funding from AB 803 and one with AB 1470. The series title was changed to *California History: On Location* for ITV distribution. The final program titles and KQED-ITV program guide descriptions were as follows:

1. "Island of Secret Memories: The Immigration Station in San Francisco" (1987). A Chinese-American schoolboy comes face to face with the spirit of his deceased grandfather when he visits the empty immigration barracks on Angel Island. Through his visit, he sees what life was like for Chinese immigrants waiting to learn if they were admitted to America.
2. "Sketches from the Capitol: The State Capitol in Sacramento" (1987). A class of school children tour the capitol, studying the symbols on the Great Seal of California, and learning the rights and responsibilities of citizens in a democracy.
3. "California Recuerdo: Old Town in San Diego" (1988). A young Mexican-American girl arrives to spend Christmas with her godfather in San Diego. She discovers her heritage through watching Las Posadas, candle making, examining artifacts, and reading the recuerdo (memoir) of a woman whose life spans the Mexican period.
4. "Portraits in Gold" (1990). A youthful 49er tells the story of boom and bust in pre-service, examining the heritage of the California gold rush on economic attitudes. Also presented are the issues of social and economic conflicts that arose in gold mining communities. Marshall's Mill and Columbia State Historic Park are the settings for this program.

Vox Productions, Inc., prepared twelve 3/4 inch broadcast-quality masters of each program for distribution to the regional ITV agencies and county video duplication centers. Assistance in distribution was provided by the California Instructional Video Consortium (CIVC).

The CHS School Program printed 1,000 copies of the print materials for each of the first three programs and, in consultation with CIVC, distributed them through the county media centers and instructional television stations.

The first edition of the teacher's guides for *On Location* programs included materials for the first three programs and were bound in a single series volume. With the completion of the fourth program in the series it was decided to separate the suggestions for teaching the programs into four separate publications.

Termination of Project Partnership. After the first program, "Island of Secret Memories," in the *On Location* series was completed, and while the second and third were in production and pre-production stages, the CHS Board of Trustees began to address two issues that would ultimately lead to the end of the partnership between the Society and the CDE. The first issue involved confidence in the staff of the CHS School Program that stemmed from dissatisfaction with the first video program on the part of some Board members. The second was an emerging financial crisis that finally became so severe that the Board of Trustees was forced to take rather serious measures to ensure the survival of the Society.

A minority of CHS Board members objected to the candor with which the "Island of Secret Memories" dealt with anti-Chinese sentiment that developed in the United States after the Civil War. One member in particular objected to the characterization in the video of the exclusionist policies as a reflection of racism towards Asian peoples, and, thereafter, some Board members wanted to impose editorial control over the series production. At the same time, the financial problems of the CHS began interfering with fund-raising efforts for the *On Location* series by CHS staff and that, in-turn, put a strain on the relationship with the Office of Educational Technology. Consequently, the CHS School Program staff members found themselves in an increasingly difficult situation and decided to terminate the project when the third program and the support materials were completed.

Subsequently, the Office of Educational Technology contracted with Vox Productions, Inc., to complete production of "Portraits in Gold," the fourth program in the *On Location* series. In turn, the management of Vox engaged the services of the former CHS School Program staff members, who had established a consulting firm, New Directions Curriculum Developers, to help in the production of the video and to prepare the teacher's guide for the program.

Program Distribution. As a result of the original grant contract negotiations, the California distribution rights for the *On Location* programs were retained by the CDE, and the California Historical Society was granted the rights for distribution in all other areas. This situation remains in effect even though the CHS has not made any efforts to market the series since the project was terminated. All rights for distribution of the fourth program, within and beyond California, are retained by the CDE. Reproduction and sales of *On Location* series programs are performed by the Media Sales Department of the Alameda County Office of Education on behalf of the CDE.

V. Resources to Support the Project

Support Factors. The unsolicited proposal from the CHS for the *On Location* series submitted to the CDE in March of 1987 was approved for support with AB 803 fiscal year 1986-87 funds allocated, as noted above, to the Curriculum Materials Development and Acquisition initiative. A grant totaling $264,456 was authorized for the production of five programs. In negotiating the grant, the CDE had agreed to support 70 percent of the cost the series, and the CHS would raise the balance. The 70-30 ratio was to vary, though, considerably for the separate programs (see table in Project Budget section below).

Adequacy of Resources. By the time that the third program in the *On Location* series was in production, the financial problems of the CHS had reached the point that all of the principles in the project realized the program was in such jeopardy that the partnership would have to be altered dramatically or dissolved. When it became clear that the Society would no longer be able to devote sufficient attention to fund-raising to come up with the remainder of the amount pledged (over $46,000) to finish production of the "Bakersfield" and "Los Angeles" episodes (see table under Project Budget below), the CHS School Program staff made the decision to

cease pre-production on the fourth and fifth programs in the proposed series and to terminate the project when the teacher's guides for the first three programs were completed.

At the suggestion of the Office of Educational Technology, Vox Productions, Inc., submitted a bid for the production of the fourth program in the *On Location* series, "Portraits in Gold," and completed the project in 1990 using funding left over from the CHS contract. The former CHS School Program staff members, now organized as New Directions Curriculum Developers, completed the print support materials in the Spring of 1991 under a subcontract with Vox.

VI. Program Support, Resources and Constraints

Before the partnership between the CDE and the California Historical Society was terminated in 1988, the Office of Educational Technology had authorized payment to the CHS for the first three programs in the *On Location* series. As noted above, the fourth program, "Portraits in Gold," was completed under a separate grant award to Vox Productions, Inc., with a subcontract for the teacher's guide and other print materials to New Directions Curriculum Developers. As of this date there are no plans to produce the fifth program proposed for the series.

1. ***Project Budget.*** The original grant budget estimates and amounts actually paid for production of completed programs in the *On Location* series are summarized below:

Table 4. Project Budgets

Program Site	Amount CDE Grant Authorized	Amount of CHS Share	Budget Total	Amount Expended
San Francisco	$ 63,597	$ 5,980	$ 69,577	$ 69,577
Sacramento	64,406	6,165	70,571	70,571
San Diego	23,221	55,346	78,567	78,567
Subtotal	$151,224	$ 67,491	$218,715	$218,715
Bakersfield	57,366	23,074	80,440	None
Los Angeles	55,866	23,074	78,940	None
Subtotal	$264,456	$113,599	$378,055	$218,715
"Gold Country"	$108,000	None	$108,000	$108,000
TOTAL	$372,456	$113,599	$486,055	$326,715

2. ***Cost Benefits.*** The 70-30 ratio of CDE to CHS funds to pay for production of the programs in the *On Location* series was essentially maintained, with the Society contributing slightly under 31 percent of the cost of the three completed units. It seems clear that the assumption (embedded in the CHS proposal and quoted above under Rationale) that the lack of a national market for materials supporting the fourth grade history-social science curriculum "makes it unlikely that elementary level curriculum in California will be created by the commercial publishing industry," remains accurate to the present date. Thus, the creation of *On Location* curriculum materials through the matching-funds grant process in partnership with a non-profit public agency with very low overhead costs represents a cost-effective method for addressing a well established curriculum need.

   For a more complete discussion of the cost benefits of production partnerships, see the section in this report on Instructional Television Licensing and Program Acquisition.

3. ***Budget Equity***. Since the California Historical Society's proposal was not solicited by the CDE there could not be any challenges to the equity of the award because it was not a competitive program. And, because *On Location* met the criteria for funding under the Curriculum Materials Development and Acquisition initiative of AB 803, there were no real issues of equity involved in the allocation of CDE resources to the project.

4. ***Leveraging and Institutionalization.*** As a matching-funds grant, the CHS video project had a built-in "leveraging" factor in which state funds stimulated the contribution of private funds channeled through the non-profit CHS. The distribution system utilized for getting the *On Location* series programs to schools, ITV agencies and county offices of education, also takes advantage of established effective dissemination agencies and extends the impact of the project at very little additional cost to the state or to the end users of the videos.

5 ***Budgeting Procedures***. As a relatively small scale, one-of-a-kind unsolicited project the CHS video production effort was administered without much difficulty, and budgeting procedures posed no special challenges or problems (other than the financial problems that beset the Society).

Governance Constraints. At various times during the project, the CHS School Program staff had to cope with competing sets of expectations from the different agencies providing support for the *On Location* series. Obviously, the California Historical Society had a preeminent interest in planning and operational management of the project and the problems of control over the editorial content of the series programs has already been described. In addition, the foundations (Haas, Jerbode, and San Francisco) that had provided the grant funds to produce the first program in the series expected the CHS staff to report on how well they had accomplished the terms of the original grant proposals, which did not envision production of a series of programs. One of the basic expectations of the CDE was that the CHS project would produce a series of programs, and the CDE wanted an *On Location* Advisory Committee to give input to the subject matter and editorial content of the series programs.

Then, because production of the first program was well along by the time that the CDE Advisory Committee was established, none of the Committee members was able to review the scripts or rough video edits. Consequently, the CHS School Program staff was not able to accommodate the sometimes competing expectations of the different agencies supporting the project.

VII. Outcomes

The partnership between the California Historical Society and the California Department of Education for production of the four videos in the *California History: On Location* series resulted in the creation of instructional materials that met an expressed curriculum need. The videos were produced at a relatively low cost to the state when compared with conventional commercial ventures.

The programs in the *On Location* series are not among the instructional videos identified by the ITV agencies as the most popular with teachers in California.

VIII. Current Status

These videos continue to be available to educators in California. No similar projects have been funded.

IX. Strengths/Facilitating Factors

- The programs produced reflected the cultural diversity of California and covered topics which are not included extensively in textbooks.
- The CHS raised significant funding (over $113,000) to help support production of the series.
- Extensive curriculum materials were developed to accompany the television programs.

X. Weaknesses/Constraints

- The CHS encountered serious financial problems shortly after production of the *On Location* series began, and these problems contributed to the decision to withdraw from the project.
- Some of the CHS Board members considered part of one of the programs too controversial and a few of them wanted to have editorial control over the series.
- Support for the *On Location* series from the CHS Board became inconsistent, and the development partnership with the CDE fell apart due to internal problems at the CHS.
- Three of the four videos produced were found to be of poor quality by many educators, and none are among the popular ITV titles.

XI. Recommendations/Promising Practices

- Additional video production projects should be funded, but with better quality control and coordination. There is still a lack of high-quality technology-based materials on California history.
- Any future projects of this type should have advisory committees of history and video experts to ensure that controversial issues over program content do not interfere with production.
- Involve the curriculum offices of the CDE and the Subject Matter Projects in the development of any future programs.
- Consider any future California history tapes as interdisciplinary in both development and application.

VCR Distribution

I. Background

Project Description. In September, 1985, a videocassette recorder (VCR) was distributed to each public school in California. The distribution of the approximately 7,100 VCRs was conducted through the County Office of Education Media Centers, which also provided training on VCR operation, uses of instructional television, and copyright law to each school. The schools were required to send one or more representatives to this training session prior to receiving the VCRs. The California Department of Education stated in the distribution memo to county and district superintendents that "it is our hope that expanded learning opportunities for students will result from the use of the equipment which will allow for flexibility in recording desirable programming and in presenting timely information to students and staff" (California Department of Education, 1985c). The VCR distribution project, funded by Assembly Bill 803 was recommended by the Educational Technology Committee.

Legislative Authority. Assembly Bill 803 authorized the Educational Technology Committee to establish special projects to support other state-wide reform efforts. Since videocassette recorders can be used to enhance classroom instruction in a variety of ways, the Committee recommended the VCR "donation" to address its goal of assisting districts in acquiring the latest, most appropriate equipment and methods for applying technology in California schools. The State Board of Education approved a $1.7 million allocation to purchase one videocassette recorder for each public school building.

II. Project Planning

Rationale. The Educational Technology Committee saw that there was a need for schools to have better access to ITV programming. At the time of the distribution, videocassette recorders were not widely distributed in schools. Schools without VCRs were not able to record ITV programming for use at convenient times, thus limiting its application in the classroom. The Committee also felt that there was a great need for training on how to integrate ITV into the curriculum. The training and the actual distribution were handled by the County Media Centers.

III. Project Development

Project Objectives. The Educational Technology Committee's goal in funding the VCR distribution was to promote the use of ITV regional agency services by allowing teachers to record ITV programs off the air and then show them at convenient times. Schools and districts could also maintain libraries of state or locally licensed programs on tape for teachers to borrow when they could best be used to augment classroom instruction. By requiring representatives from the schools to undergo training, the committee helped to ensure that the VCRs would be used effectively to supplement the curriculum.

Project Components. The VCR distribution project addressed two of the major elements of the state's educational technology initiatives, including:

1. ***Staff Development.*** Each county media center provided training in VCR operation, ITV utilization, and copyright law, to each school that received a VCR. The training sessions were 2-3 hours long and covered basic VCR operation, curriculum integration, ITV services and resources, and copyright law. The curriculum

integration training included information on the Technology in the Curriculum (TIC) Projects and Guides, the regional ITV agencies, and the state and locally licensed ITV series and supplementary materials.

A training guide for state-wide use was prepared by the Northern California County Media Educators (NCCME) and distributed to each county office of education. The training guide included instructions on how to set up the VCR and connect it to the TV, how to record and play back programs, and how to obtain ITV programming information from the ITV Agencies. In addition, guidelines and forms were provided for the media centers to use for the orderly distribution of the VCRs to schools. Extensive information on copyright laws pertaining to the recording of broadcasts and on the licensing of programs was also included.

A variety of presentation materials, including overheads and handout masters were provided along with the training guide. The handouts provided information on how to integrate ITV into lessons, and some sample activities and forms for teachers to use. Within KQED-ITV's service region, a 10 minute demonstration tape was provided. County offices outside KQED's region could order the tape. The tape, which was designed to be a brief overview for teachers unfamiliar with ITV, included a brief history of instructional television and short segments from a few ITV series.

Each media center provided information on local services to the teachers, including program schedules and guides from the appropriate ITV regional agency, the media center's catalog, county newsletter and fliers, and a list of county media personnel.

2. ***Evaluation.*** A state-wide, systematic evaluation of the impact of the VCR distribution was not conducted. It has been reported that individual agencies have surveyed the impact of the distribution. For example, the ITV agencies reported that the VCR distribution increased the classroom use of instructional programming.

IV. Project Implementation

After funding for the VCR distribution was allocated, the California Department of Education developed a set of specifications for the VCRs and then sent it to prospective bidders. Once the winning bid was selected, the vendor, Sears, shipped the VCRs directly to the media centers. The media centers then distributed the VCRs and provided ITV utilization training to almost every school in the state, as planned by the Educational Technology Committee.

V. Resources to Support the Project

The County Media Centers were the main source of support to the VCR distribution project. They were actively involved in both the planning and implementation of the distribution and were the major source of staff development. The Northern California County Media Educators (NCCME), in particular, were a valuable source of assistance. NCCME members developed the plan of distributing the VCRs through county offices and presented it to the Educational Technology Committee, who quickly endorsed it. The staff development outline and materials were also developed by NCCME members.

VI. Support funding and resources and constraints

1. Budget. The VCR distribution was funded entirely by AB 803. Additional funding for the staff development and related materials was provided by county offices of education and the ITV Regional Agencies.

2. Cost Benefits. The VCR distribution was very cost-effective since a large discount was obtained by purchasing such a large quantity of VCRs at once. It is estimated that approximately $1.5 million was saved over what schools would have paid individually for comparable VCRs. Many of the VCRs are still in use today, showing that the benefits of the program continued long after the initial purchase. By distributing VCRs to all schools, access to technology was improved without costly grant application procedures.

3. Budget Equity. The fact that only one VCR was allocated per school, regardless of school size, resulted in access being much greater at smaller schools where fewer teachers had to share the equipment. However, there was state-wide equity with every school being included.

4. Leveraging and Institutionalization. Additional funding was leveraged in that many districts purchased additional VCRs and other video equipment in 1985-86 and in latter years. The VCRs and training helped to institutionalize ITV in the classroom by making it more accessible to teachers and students since programs could be recorded and shown at the appropriate times.

VIII. Outcomes

The objective of the distribution, to promote the use of ITV in the classroom, was achieved by giving teachers greater access to instructional video programming. This improved access to programming affected a significant proportion of teachers and students in the state since every school received a VCR with ITV utilization training. The "free" VCR served as an incentive for schools to send teachers to training sessions that they might not otherwise have attended. The VCRs also served to encourage schools to purchase additional equipment and programming and to utilize the services of their County Media Centers and ITV Regional Agencies.

IX. Current Status

There have been no other state-wide distributions of equipment.

IX. Strengths/Facilitating Factors

- According to anecdotal reports, the program stimulated increased use of ITV and video in classrooms.
- Approximately $1.5 million was saved in comparison to what the schools would have paid individually for comparable VCRs.
- The staff development and distribution services of the county offices of education and ITV agencies were contributed at no additional cost to the individual school budgets.
- The VCR distribution provided an incentive for teachers to attend valuable training sessions on the use of ITV to improve classroom instruction.
- The program provided teachers with the ability to record programs to be viewed at a later date.

- All California schools benefited directly from the program.

X. Weaknesses/Constraints

- An evaluation of school use of the VCRs was not conducted.
- Strictly speaking, the allocation of one VCR per school was not equitable because teacher access to the equipment at small schools was higher than at large schools where the VCR would have to be shared by more teachers.

XI. Recommendations/Promising Practices

- In any future programs of this type, sample ITV programs, appropriate for different grade levels, should be included with the equipment, along with sample lesson plans and activities so that teachers can begin using what they learn immediately.
- A distribution of laser disk players by the CDE should be considered in order to promote the use of state supported programs such as *GTV* and *Science 2000* which require laser disk players.
- Because TRIE (on the CSUNet) is underutilized, due in part to a lack of modems in schools, modems and user-friendly telecommunications software should be distributed to schools to encourage the use of TRIE.
- Assess the cost-benefits and utilization of any future equipment distributions.

Instructional Television Licensing and Program Acquisition

I. Background.

Program History. In 1982, the California Department of Education (CDE) established a program of acquiring multi-year licenses from the producers or distributors of instructional television (ITV) series for the rights to distribute educational materials to schools in the state. In a few cases, the CDE has also negotiated rights to computer software packages designed to accompany an ITV series. This system of ITV Licensing/Program Acquisition provides California schools with access to high-quality instructional video at low-cost. The ITV licensing program is administered by the CDE's Office of Educational Technology, with the advice of the Educational Technology Committee.

Legislative Authority. The Instructional Television Act of 1974, Assembly Bill 490 (Quimby-Marler), first authorized the California Department of Education to acquire ITV programs and to provide state-wide coordination of ITV services to eliminate duplication of effort. Under this legislation, CDE funds were used primarily to develop ITV programming in consortium arrangements with other states and productions groups such as the Agency for Instructional Television (AIT; now known as the Agency for Instructional Technology). In this way, the CDE facilitated development of high-quality programming and utilization in the areas of highest priorities of need. Between 1985 and 1989, Assembly Bill 803 (Katz-Naylor) continued authorization for cooperative licensing and development agreements with ITV producers and provided for the current system of negotiating rights to use existing ITV series.

California Instructional Video Consortium. The current educational technology legislation, Assembly Bill 1470, charges "a network of instructional television agencies" with the responsibility to make recommendations to the Educational Technology Committee and the Superintendent of Public Instruction about the acquisition of licenses permitting the most flexible uses of instructional video programming by teachers and pupils. Each year, acting upon recommendations from the members of the California Instructional Video Consortium (CIVC), the CDE negotiates cooperative licensing and development agreements for rights to use instructional television series to support instruction at all grade levels and for most curriculum areas. CIVC, the "network" of staff from the ITV Agencies in the state and media specialists from several county offices of education, was formed in 1984 to make formal the cooperation among the regional agencies and the CDE. The Consortium is charged with advising appropriate state agencies and organizations about the evaluation, acquisition, development, distribution and utilization of video materials and other emerging technologies.

Governance and Distribution. The ITV licensing program is administered by the CDE's Office of Educational Technology. Broadcasting, master videotape duplication, and staff development activities related to effective use of the state-licensed series are performed in each region by the ITV agencies. (See the section on ITV agencies in this report for information about agency governance.) In addition, each of the ITV agencies allocates local funds to license programming to meet regional needs. Some of the computer software programs are available at Software Resource Centers in selected county offices of education around the state. Software programs related to the video economics series are available from the network of Centers for Economic Education located at most California State University campuses. A few software programs are distributed to schools directly by the Agency for Instructional Technology.

II. Program Planning

Needs Assessment. The annual process of planning the ITV licensing and acquisition program involves several agencies in addition to the Office of Educational Technology. CIVC, in its capacity as the network of instructional television agencies under the provisions of AB 1470, conducts an assessment of the needs for ITV programming by students in California. This needs assessment process has recently become a formal part of the CDE's license acquisition procedures. The CIVC Program Acquisition Committee applies CIVC standards for acquiring ITV series and programs and coordinates CDE procedures for reviewing and approving recommendations for programming. The process is described below in Section IV, Program Implementation.

III. Program Description

Program Purpose. The purpose of ITV licensing and program acquisition is to encourage extensive legal use of high-quality video programs in classrooms and to save media centers and ITV broadcast agencies considerable amounts of general fund resources. The system of ITV licensing and program acquisition provides California schools with cost-effective access to high-quality instructional video. State-wide licensing arrangements ensure the delivery of greater quantities of video programming at substantially lower cost than would be possible if local education agencies (LEAs) were to purchase ITV programs on an individual basis.

State-wide ITV licenses allow unlimited use of programming for broadcast and for low-cost duplication of videocassettes for use at convenient times by teachers.

Program Emphases. Several broad programmatic considerations guide the ITV licensing and program acquisition process. The overriding goal is to encourage schools to integrate educational technology in school planning and curriculum programs. More specifically, the licensing program addresses several components of school improvement, including:

1. ***Curriculum.*** Alignment with the California Curriculum Frameworks is high among the criteria for selecting ITV programming for state-wide licensing. Over the years, the program has also made use of the Model Curriculum Standards, the Technology in the Curriculum (TIC) resource guides, and other CDE publications that provide guidance on curriculum improvement.

2. ***Staff Development.*** The licensing and acquisition program is not concerned directly with the delivery of staff development on the effective use of instructional video. Information about the state-wide licensing program, however, is provided in the staff development and outreach programs of the regional ITV agencies and other regional support groups such as the media centers at the county offices of education and the regional consortia of the California Technology Project (CTP).

3. ***Dissemination.*** Dissemination of state licensed ITV programming is provided by the seven ITV regional agencies and various regional support groups.

4. ***Evaluation.*** While assessment of the instructional contributions of ITV is central in the process of selecting programming for state-wide licensing and acquisition, evaluation of the outcomes of the program itself are limited to estimates of cost-effectiveness. This is discussed below.

IV. Program Development and Implementation

Licensing Procedures. In its capacity as the network of instructional television agencies under the provisions of AB 1470, CIVC plans and conducts an annual assessment of the ITV programming needs for students in California. Composed of the Directors of the seven regional ITV Agencies plus appropriate staff members and representative County Office Media Directors, CIVC advises appropriate state agencies and organizations about the evaluation, acquisition, development, distribution, and utilization of instructional video materials and other emerging technologies.

Through cooperative licensing and development agreements, the CDE presently has rights to 57 instructional television series. In addition, the CDE is a member of the Pacific Mountain Network (PMN), which negotiates for discounted ITV series licensing in 13 western states. Although there are a few single ITV programs licensed by the CDE and PMN, most include from six to fifteen program titles. The individual programs range from 10 to 30 minutes in length, averaging about 15 minutes. The licensing fees for a single series range from no cost (for drug education programs produced with other government funds) to over $277,000 for one series of 60 fifteen minutes programs licensed in perpetuity from AIT.

While the licenses for some series must be renewed annually, most are licensed for use for six or seven years. Longer-term licenses generally involve reduced fees and contribute to increased savings for California schools. Some AIT series are licensed for as long as 12 years and another 17 series are licensed in perpetuity.

Selection Procedures. Recommendations for acquisition of state-purchased programming are made exclusively by vote of the seven ITV directors although county media directors and ITV Agency staff members are consulted as recommendations for acquisitions are developed. The CIVC Program Acquisition Committee is charged with the application of CIVC standards for acquiring ITV series and programs and coordinates CDE procedures for reviewing and approving recommendations of programming. Each year, during the first three weeks of January, the committee solicits written recommendations for ITV series from CIVC members. The committee prepares an annotated list of series and forwards it to the ITV agency directors by February 1st. Agency directors solicit input from regional advisory groups, establish priority lists of ITV series, and return the list to the committee by March 1st.

While the regional ITV Agency deliberations are taking place, curriculum consultants in the CDE also review the series against standards of alignment with the California Curriculum Frameworks. During the first week of March, with input from the ITV agencies and the CDE, the CIVC Program Acquisition Committee compiles a final list and announces the results at the next regular meeting of CIVC. Afterwards, CDE consultants negotiate licensing arrangements with ITV producers and notify the agency directors of the results by the end of March.

V. Program Support Resources

State and Local Support. As stated above, the state has supported the ITV licensing and acquisition program since 1982. The value of the program to the state has been recognized in all subsequent educational technology legislation, including the current legislation, AB 1470. Between 1984 and 1988, state expenditures averaged about $281,000 per year for the program.

In addition to the state's investment, though, the seven regional ITV agencies also spend about one-fourth of their annual budgets on program licensing and acquisition. The total, in 1988-89, was $681,403. Together, the state and local agencies allocate nearly $1 million each year to acquire programming to meet state and local needs.

VI. Program Funding Resources and Constraints

1. ***Program Budgets.*** The allocation of state funds for ITV programming acquisition has fluctuated considerably over the years, ranging from $79,500 to $637,153. The smallest allocation, in 1987, was in the year that half of the educational technology funding was vetoed from the CDE budget by the Governor. The largest single amount, in 1986, was spent to secure licenses to the series that had been identified as the most appropriate for supporting the state curriculum frameworks by the Technology in the Curriculum (TIC) projects.

   Licensing fees paid in recent years include:

Fiscal Year	Amount
1984-85	$ 208,503
1985-86	276,000
1986-87	637,153
1987-88	79,500
1988-89	205,000
1989-90	298,180
1990-91	225,000

2. ***Cost Benefits.*** Any assessment of the outcomes of the ITV licensing and acquisition program will focus, by necessity, on the cost-benefits that it provides to the state. This was addressed in the response of the Office of Educational Technology to questions from the Office of the Legislative Analyst about the AB 803 Educational Technology Sunset Review Report as follows:

   It should be noted that the state-wide licenses are all multi-year licenses which result in at least a 20 percent discount savings per year. ITV licensing has been limited to series for which unlimited rights include broadcasting, off-air recording, and duplication of video-cassettes. The savings to individual districts, if every district were to purchase as complete series directly from the producing or distributing agency, are astounding. For example, AIT sells an individual 15-program language arts series for $125 per program or $1,875 for the series. If every school district were to purchase just one copy of the series at that price, the total expenditure would be $1,929,375, versus $30,395 paid for the seven-year unlimited state-wide license!

   A more realistic approach, would be to compare the annual licensing costs that the seven ITV regional agencies would be required to pay during the seven year period. This cost for the same 15 programs in the series would be $97,314.

   In the case of the AIT Consortia Projects, there are also two ways to calculate the savings to the state, since these projects are developed cooperatively by all participating state education agencies or public broadcasting agencies.

   For the nine AIT consortia series acquired during 1984-88, the total costs to develop these series and the total costs as a participating state are noted below. The savings, viewed in this manner are very impressive.

	Total Development Costs	*California's Costs*
	$ 578,744	*$ 36,024*
	448,370	*30,395*
	800,000	*81,549*
	1,453,320	*163,618*
	1,165,728	*104,267*
	780,137	*0*
	694,255	*46,462*
	474,906	*27,446*
	445,086	*33,773*
TOTALS	*$ 68,840,546*	*$ 496,534*

Another approach would be to list the multi-year costs to acquire these licenses by the seven regional agencies. The differences are based on the fact that ITV producers charge a base fee to each agency and a much higher per pupil use fee for small agencies. Multi-year licenses (five years or more) also include as much as a 40 percent discount.

Two comparisons are provided based on AIT's production system:

Multi-State Consortium: Solve It — *6th grade math*
12-year rights, 18 programs, each 15 minutes in length

Development costs: $1,165,728
California license fee: $104, 267 or (÷ 12) per year = $8,689
Cost to 7 Regional Agencies per year: $33,372
12 year cost: $400,464
The total savings for this series equal $296,197

Pre-Production Lease: Watch Your Language
7-year rights, 15 programs, each 15 minutes in length

Development costs: $474,906
California license fee: $27,446 or (÷ 7) per year = $3,921
Cost to 7 Regional Agencies per year: $13,902
12 year cost: $97,314
The total savings for this series equals $69,868

It should be emphasized that these series were acquired based on needs identified via CIVC and teacher recommendations in each of the ITV regions. With few exceptions, these series have also been included among the most highly rated ITV series cited in the Technology in the Curriculum Guides.

3. ***Budget Equity***. Because ITV licensing and acquisition is administered as a state-wide program, it is able to achieve very equitable distribution of funding across rural and urban settings and for all students, including the complete range of low to high achievement.

4. ***Leveraging and Institutionalization***. In addition to the state-licensed series, the individual ITV agencies license a variety of other programming based on locally assessed needs. If the ITV agencies had to license all series directly from the producers, there would not be sufficient funding for the wide variety of programming that they currently offer.

VII. Outcomes

Attainment of Program Objectives. In terms of state-wide impact, the program of ITV licensing and acquisition apparently achieves a very good return on the state funds invested. In the 1990-91 academic year, there were 57 series licensed for use by all of California's schools. These series included 707 individual programs ranging from 10 to 30 minutes in length and averaging about 15 minutes. Programming is available for all subject areas and at all grade levels.

VIII. Current Status

The ITV licensing and acquisition program was reauthorized under AB 1470 and continues to the present time. As one of the more established and cost-effective programs administered by the Office of Educational Technology, ITV licensing and acquisition seems to have proven its worth in the overall effort of improving curriculum and instruction in California. However, concerns are expressed by the CDE about the degree to which ITV programs are aligned with the California Curriculum Frameworks.

IX. Strengths/Facilitating Factors

- Significant savings are achieved over the amount that the ITV agencies or school districts would have to pay individually to license high-quality video programming regionally or locally.
- Programs are reviewed by CDE subject area consultants for alignment with the California curriculum frameworks.
- State-wide licensing promotes equitable access to ITV programming across the state.

X. Weaknesses/Constraints

- There is little direct input from teachers or students in the ITV selection process.
- Concerns have been expressed by the CDE about the degree to which the programs are actually aligned with the curriculum frameworks.
- Some ITV agency personnel express concern that teacher preferences and the judgment of professional media specialists are not considered in the video selection process.
- The ITV licensing program is not formally coordinated with the evaluation work of the California Instructional Video Clearinghouse.
- There is no systematic state-wide evaluation of the level of use and impact of these programs.

XI. Recommendations/Promising Practices

- Teacher and student input should be utilized to a greater extent in choosing series for licensing.
- Sample surveys of teachers should be conducted periodically to determine the level of use and the effectiveness of the currently licensed ITV series.
- The California Instructional Video Clearinghouse should have a formal role in the ITV licensing and selection process.

Educational Telecommunications Network (ETN) Staff Development Program

I. Background

Program History. The California Department of Education (CDE) provided funding to the Educational Telecommunications Network (ETN) to produce programs on using technology to support instruction. The project grew out of an unsolicited proposal from the Los Angeles County Office of Education (1988). The Los Angeles County Office of Education (LACOE) proposal, entitled "The Use of Technology in the Implementation of Curriculum Reform and California State Frameworks: English-Language Arts and Mathematics," was submitted on December 8, 1988, to the Office of Educational Technology. The LACOE requested $72,461.60 to produce and broadcast four interactive staff development programs over ETN during the 1988-89 school year. The programs proposed were:

> *Technology Use in Implementing the English-Language Arts Framework: Elementary*
> *Technology Use in Implementing the Mathematics Framework: Elementary*
> *Technology Use in Implementing the English-Language Arts Framework: Secondary*
> *Technology Use in Implementing the Mathematics Framework: Secondary*

The Educational Telecommunications Network had been established in October of 1988 by the Los Angeles County Office of Education. In an information brochure, "ETN Live!," the LACOE described the original purpose of the Network:

> *To provide televised distance learning to 95 public school and community college districts in the 4,083 square miles that are Los Angeles County. It solved the riddle of how to provide accessible staff training to educators with no budget, no time, no teacher substitutes, and no room on the freeway.*

Since that time, ETN has expanded its scope of operations and now counts 38 of California's 58 counties as ETN Member Counties. Member districts have access to staff development programs through an interactive network (involving one-way television broadcast via a KU-Band satellite 22,500 miles above the equator and two-way telephone hookups with the presenters at the broadcast site). The ETN service is available free to all schools in Los Angeles County and to other agencies for a modest subscription fee. The ETN broadcast signal is not scrambled and can be received by any agency with a satellite down-link capability. ETN member agencies receive (1) schedules of forthcoming ETN programming, (2) information about the availability of Leader's Guides for the programs, and (3) other "field materials" for the coordinators of staff development programs.

Legislative Authority. A grant of $40,000 from fiscal year 1988-89 Assembly Bill 803 funds was awarded to the LACOE for the period March 1 to December 31, 1989. Funding for the ETN project came under the Office of Educational Technology's initiative of Staff Development Services.

Project Governance. The CDE grant for the ETN Staff Development project was supervised by the Office of Educational Technology and was administered by the Los Angeles County Office of Education. Production operations of the project were to be overseen by an Advisory Committee representing groups who would have input into the proposed project.

II. Project Planning

Project Objectives. In requesting AB 803 support for the ETN technology programs, the LACOE outlined a plan to "produce 'stand alone' staff development packages consisting of a video tape and 'Leader's Guide' (collection of support materials to facilitate use of the video in a variety of staff development situations)." The proposal stated the program goals:

> *The purpose of the programs and subsequent staff development packages is to provide information, processes, and examples of how technologies should be integrated in curriculum reform as outlined in the content area frameworks of English-Language Arts and Mathematics. These programs build upon work started in a variety of projects and programs including the California Literature Project, [Project] Equals, Model Technology Program, Technology in the Curriculum and ongoing staff development efforts of the Los Angeles County Office of Education, The California State Department of Education and school districts throughout the state.*

Project Design. In conceptualizing the ETN staff development series, the project staff planned to videotape examples of classroom applications of educational technologies to provide visual examples of how they could be successfully infused into curriculum reform efforts. These video segments would then be inserted into a live broadcast during which experts would discuss key issues of using technology as a tool for the implementation of the curriculum frameworks. A panel of practitioners was to be included to provide the audience an opportunity to ask questions during the broadcast. A video tape of the complete live broadcast would then be post-produced for inclusion with the Leader's Guide staff development package.

Content. The content of each of the proposed staff development programs was to be "driven by the major philosophical assumptions and program transformations suggested" by the California curriculum frameworks and the prerecorded video "inserts" were intended to provide examples of teachers using technology to implement the intents of the frameworks. The ETN proposal also outlined how the production would benefit staff development capabilities more generally:

> *Another aspect of the program will be the identification and training of "Content Specialists." These individuals will be trained to work with an existing cadre of "Satellite Facilitators." These teams of specialists and facilitators will be on site during live broadcasts to ensure the programs are true staff development events. They will facilitate pre- and post-viewing activities, deal with group dynamics, solicit questions to be called in and answer questions which can be dealt with at a local level. Trained content specialists and facilitators increase the transferability of this type of distance learning program.*

Advisory Committee. The advisory committee was to include (1) representatives from educational technology equipment manufacturers; (2) staff of the Model Technology Schools (MTS) program; (3) educational technology staff at California State University, Long Beach and the Los Angeles County Office; (4) local school district administrators; (5) the Regional Educational Television Advisory Council (RETAC); (6) teachers from the California Literature Project and the Los Angeles County Technology Network; (7) the CDE; and (8) ETN Mathematics Content Facilitators.

III. Project Description

Project Emphases. While primarily a staff development project, the ETN Staff Development technology program had elements that related to other school improvement initiatives of the CDE and the Office of Educational Technology. These included the following:

1. ***Curriculum.*** As noted above, the purpose of the project was to provide information and examples of how technologies should be integrated with instruction to achieve the objectives of the California Curriculum Frameworks in English-Language Arts and Mathematics. The programs to be produced were to provide information on (a) several computer technology applications (drill and practice, tutorials, simulations, problem solving, on-line and telecommunications desk-top publishing, word processing, and databases), (b) video technologies (instructional television distance learning, teacher and student video productions, and interactive video disc systems, and (c) courseware resources (Technology in the Curriculum [TIC] Guides, and Consortium Software Evaluations).

2. ***Staff Development.*** The ETN Staff Development project was a major effort to produce high-quality interactive staff development programs and to disseminate them through a telecommunications network to educators throughout California. In its Leader's Guide ETN describes itself as "part of dynamic staff development effort in California. It is the vision of ETN to provide staff development opportunities which promote development of the skills necessary to implement the reform movement in California."

3. ***Learning Resources Management.*** By providing educators with visual examples of how to go about integrating technology with classroom instruction, the ETN project was an effort to integrate more effective use of distance learning technology with staff development in aligning school instructional programs with the California Curriculum Frameworks in English-Language Arts and in Mathematics.

4. ***Dissemination.*** In the LACOE proposal to the Office of Educational Technology, ETN described its outreach strategies for the proposed technology programs:

   > *Dissemination will be accomplished through the live broadcasts which will be available to anyone with the appropriate KU downlink capacity (anywhere in the United States). In addition, the Leader's Guides and staff development materials may be determined by the Educational Technology Committee. These programs will be transferable to multiple school settings because they focus on grade level (elementary, middle and secondary) use of technology and will have specific applications content [that] teachers can implement. Additionally, an attempt will be made to illustrate technologies that are readily available to schools (many of which have been put into place as a result of AB 803 [adoption/expansion] site grants).*

5. ***Evaluation.*** The ETN project proposal outlined the following evaluation design for assessing the impact of the programs:

   > *An evaluation instrument (survey) will be designed and disseminated to facilitators of ETN broadcasts. The programs will be evaluated for content, processes and applicability. The instrument will also be included with the Leader's Guide and accompanying staff development materials. LACOE will collect data through this instrument as a means of assessing the [perceptions] of the viewing audiences. In addition, a selected number*

of participating districts will be asked to participate in a debriefing to provide feedback about the live broadcasts and the use of the video and Leader's Guides. An impact report will be written which assimilates the data collected.

IV. Project Implementation

Production. Because the amount of the grant was limited to just over 50 percent of the amount requested, the ETN staff modified the scope of work originally proposed, reducing the series from four programs to two, one each in the areas of English-language arts and mathematics but covering all levels, kindergarten to grade twelve, rather than separate programs for elementary and secondary grades. The two ETN staff development programs that were produced with the grant from the Office of Educational Technology were titled:

Integrating Technology Into The Teaching of English Language Arts
Integrating Technology Into Mathematics Instruction

English-Language Arts. The program on English-language arts was broadcast live over the ETN satellite network on December 7, 1989. The overview in the Leader's Guide for *Integrating Technology Into The Teaching of English Language Arts* states the following:

In this teleconference, participants will watch the ways in which [three middle school teachers] use various technologies to help their students create meaning as they respond to literature. [One teacher models] one way to use a videotape of a text. [Another models] ways in which instant cameras, videodisc players, LCD panels, video cameras, and a substantial number of computers can be used to facilitate learning in a meaning-centered language arts curriculum.

The program was 37 minutes in length and divided into four parts:

1. Using Instructional Television videotapes in a meaning-centered classroom
2. Using one computer and a LCD panel in a sixth grade class.
3. Observing a middle school class in which students use numerous different technologies.
4. Ways to use staff development for instructors.

Mathematics. The program on mathematics was broadcast over the ETN satellite network on January 11, 1990. The overview for *Integrating Technology into Mathematics Instruction* in the Leader's Guide states the need for the program as follows:

Since the publication of the Mathematics Framework for Public Schools, Kindergarten Through Grade Twelve, *educators have been exploring the use of technology to enable all students in attaining "mathematical power." Although educators have recognized the capability of calculators, computers, and visual media in providing models of the strategies needed for problem solving, developing graphic representations of mathematical models, and engaging students of differing learning styles, strategies to implement the use of such technologies have largely been left to individual school districts or innovative classroom teachers.*

Evaluation Outcomes. When the ETN technology programs were broadcast, some evaluation instruments were provided in the Leader's Guide staff development materials. The facilitators in each staff development site were to have each participant complete an "Evaluation Sheet" at the end of the session. Contrary to what had been outlined in the LACOE proposal to the CDE (quoted above), however, the facilitators were not directed to return the evaluation instruments or a summary of the results to the producers of the programs. Neither were any participating districts "asked to participate in a debriefing to provide feedback about the live broadcasts and the use of the video and Leader's Guides." Finally, no "impact report. . . which assimilates the data collected" was ever prepared for submission to the Office of Educational Technology.

V. Resources to Support the Project

Support Factors. In planning the technology programs, the LACOE drew upon the expertise of a wide range of technology and curriculum specialists to ensure that the audience would be presented with the most current information about how to integrate technology into instruction in the subject matter fields. Production of the video segments illustrating classroom integration of technologies involved expert practitioners and subject matter instructional consultants.

Facilities. The television production and telecommunications facilities of the LACOE that were used in producing the ETN technology staff development project materials had been previously provided with County Office funds and required no additional support from the CDE.

VI. Project Support, Resources and Constraints

1. ***Project Budget.*** The CDE grant of $40,000 was a one-time production grant for a specialized product designed to address needs for staff development materials that had been identified by the Educational Technology Committee.

2. ***Cost Benefits.*** Although there was no formal analysis of the cost benefits of the ETN technology project, the CDE obviously intended to make use of the LACOE facilities to produce a very cost-effective series on integrating technology into the curriculum to extend the benefits of the grant funds invested in the project.

3. ***Budget Equity.*** The distribution of the ETN technology staff development programs through the state-wide telecommunications network ensures that all schools, at least those with (or with reasonable access to agencies operating) satellite down-link equipment, have equal access to the resources of the project. Because, however, 20 counties are not members of ETN, the staff development programs in those areas are not able to make use of the series.

4. ***Leveraging and Institutionalization.*** By utilizing the already established ETN satellite network of staff development agencies, the Office of Educational Technology was able to extend, that is "leverage," the benefits of the grant funds beyond the channels of communication that were generally available to the educational technology projects.

5. ***Budgeting Procedure.*** The impetus for the ETN technology staff development project emerged as a result of informal discussions among LACOE staff, CDE staff, and members of the Educational Technology Committee. When the LACOE was encouraged to submit an unsolicited proposal for the project, the ETN staff prepared and forwarded one, then negotiated with the CDE to adjust the scope of work and budget total.

VII. Outcomes

The two programs produced by ETN for the Office of Educational Technology, *Integrating Technology Into the Teaching of English Language Arts* and *Integrating Technology into Mathematics Instruction*, were broadcast, respectively, on the satellite staff development network in December of 1989 and January of 1990. The programs are each available from ETN in cases containing a videotape cassette and Leader's Guide materials.

As discussed above the ETN did not conduct a systematic evaluation into the impact of the two programs on integrating technology into the curriculum. Therefore, no information is available about the quality or effectiveness of the programs.

The ETN does not collect data on the utilization of its programs beyond the original broadcast situations. Consequently, there is no information available about how extensively the programs might have been used or are presently being used.

VIII. Current Status

ETN continues to operate and has broadened its services to include distance learning and a wide variety of programming.

IX. Strengths/Facilitating Factors

- The program utilized telecommunications to deliver staff development as a means of increasing access at a lower cost.
- Though not funded by the state, ETN is often cited as a cost-effective staff development delivery system.
- Production of the video segments illustrating classroom integration of technologies involved expert practitioners and subject matter instructional consultants.

X. Weaknesses/Constraints

- The small size of the grant award limited the quality and depth of the production.
- Evaluation data were not collected.
- ETN has not disseminated information about the programs and has no information about the use of the programs.
- The number of educators who benefited from the series is unknown.

XI. Recommendations/Promising Practices

- Continue to explore the use of ETN facilities and services to provide distance teaching, teacher training, and in-services.
- Consider funding specific uses of ETN to increase access of information to rural parts of California.

California Mechanical Universe Model

I. Background

Program History. The California Mechanical Universe Model (CMUM) was a collaborative project developed and implemented by the California Institute of Technology (CALTECH), the California State University (CSU) and the California Department of Education (CDE). The major goal of the project was to enhance the teaching skills of high school physics teachers and to provide them with exciting instructional resources, including video tapes of the high school adaptation of the popular Mechanical Universe instructional television series and a variety of print materials and demonstration apparatus. The physics departments of five CSU campuses, Chico, Fullerton, Pomona, San Luis Obispo, and San Francisco were chosen by competitive review of proposals to take part in the CMUM project. Each received a $15,000 grant to plan and conduct a two week summer training institute for local high school teachers. Physics teachers who had only emergency credentials, were new on the job, or possessed degrees in other areas were the primary target of the institutes. Follow-up assistance was also provided to the participating teachers during the following school year (Collea, 1988).

Legislative Authority. Five CMUM grants of $15,000 were allocated from fiscal year 1988-89 Assembly Bill 803 funds.

II. Program Description

The primary goal of the CMUM was to improve and update high school physics courses to attract more students into these classrooms. The project's five specific objectives were as follows: (1) to assist local school districts and county offices in training high school physics teachers who lack the appropriate background or need updated information, (2) to disseminate the high school version of the Mechanical Universe series, (3) to enable teachers to effectively integrate the series into classroom teaching, (4) to develop a follow-up program so that teachers could share what they learned with others who did not attend, and (5) to create an on-going resource network between the teachers and the physics departments of the participating campuses.

Components:

1. ***Curriculum.*** The content of the summer institutes was mostly limited to the topics in high school level mechanics found in the Mechanical Universe Series. Mechanics includes study of the laws that govern motion, acceleration, gravity, and conservation of energy and serves as the basic foundation of physics. High school teachers were consulted in the creation of the Mechanical Universe series and helped to design the basic curriculum outlines for the summer institutes at the different campuses. The content of the videos and the institutes was checked for alignment with the California Curriculum frameworks.

2. ***Staff Development.*** Each CSU campus had a slightly different approach to planning and conducting the institutes. Each included a combination of lectures, demonstrations, field trips, interactive question and answer sessions and hands-on activities. Teacher participants were required to produce lecture and demonstration materials which they could take back and use in their classes. Many of the institutes provided teachers with an extensive array of demonstration equipment which could be used to reinforce mechanical concepts in interesting ways. The CSU staffs were required to plan the institutes in

response to the needs and abilities of the teachers in the surrounding districts. For example, at the Fullerton institute, a few experienced high school teachers were recruited to serve as peer coaches and to advise the less experienced teachers during the following academic year. The Chico institute gave teachers extensive experience in building of demonstration equipment. The San Francisco institute included useful field trips to the exploratorium and planetarium and emphasized the use of computer software in teaching physics. At San Luis Obispo, two teachers who had helped develop the high school adaptation of the Mechanical Universe series were involved in planning and presenting the institute. Pomona's presentations included a guest speaker series to give teachers up-to-date research information. The summer institute was offered as a two unit college credit course and in addition, teachers received a small stipend, partial reimbursement for expenses, an array of demonstration equipment and materials and a complete set of the high school adaptation of the Mechanical Universe video tapes and print materials.

3. ***Learning Resources Management.*** This project provided teachers with a valuable learning resource: the high school adaptation of the Mechanical Universe instructional video series. Teachers were trained on how to integrate this series with the standard textbook, lectures and demonstrations. Most of the summer institutes provided teachers with demonstration equipment to be used with the series.

4. ***Dissemination.*** A major goal of the program was for the participating teachers to share what they learned at the institute with other physics teachers in their school or district. This was especially true of the mentor teachers that participated in some of the institutes. Schools were allowed to make copies the Mechanical Universe tapes for use in other classes. Participants were encouraged to stay in contact with the CSU professors who taught the institute so that they could ask questions and borrow equipment for demonstrations. Follow-up workshops and meeting were held by some of the campuses and some of the institute staff members visited school sites where the materials were being used.

5. ***Evaluation.*** Each participating CSU campus conducted its own evaluation of the impact of the institutes. San Luis Obispo had the teachers answer open ended survey questions at various stages of the project. Almost all of the teachers comments were very positive. At Fullerton, a pre- and post-test covering basic physics concepts was given. The average score on this test was improved by 20% at the end of the institute. The other campuses did not conduct formal evaluation but due to teacher and staff comments they felt that the institutes were successful.

III. Program Implementation

The attendance objective for the summer institute was 20 teachers per campus. At Chico, Pomona, and Fullerton, 19 actually attended. At San Francisco, 18 attended, and at San Luis Obispo, 15 attended. The lower number of attendees at San Luis Obispo was attributed to the long travel distance (up to 70 miles) to the high schools in this mostly rural area. All but one teacher completed the institute. The institutes were conducted Monday through Friday for two weeks with approximately six hours of instruction and activities each day. Some of the campuses also held informal evening events and lectures.

IV. Resources to Support the Project

1. ***Context Support.*** Both the CSU professors and the participating teachers were enthusiastic about the summer institutes. Staff at all of the campuses were interested in seeking funding for future seminars and follow-up activities.

2. ***Support Resources.*** The primary resource to the project for staff and equipment was the CSU system. Only Fullerton formed a formal partnership with an outside agency. The Region 14 TECC center helped advertise and sponsor Fullerton's institute in the Orange County area. The Mechanical Universe videotapes and materials were contributed to the project by CALTECH at a greatly reduced cost.

V. Project Funding Resources and Constraints

1. ***Budget Adequacy.*** The $15,000 grant was not quite sufficient to cover all of the costs of the institute, especially the cost of teacher demonstration equipment. Chico asked districts to contribute $100 per teacher for equipment, San Luis Obispo requested $75, and Fullerton received $1,920 from TECC 14. San Francisco and Pomona were not able to provide teachers with extensive demonstration equipment.

2. ***Cost Benefits.*** At a cost of about $800 per participant, the CMUM project was an effective way to improve the skills of inexperienced physics teachers. The project specifically targeted teachers who lacked physics teaching skills so that money was not spent on teachers who did not need the extra help. A great savings over list price was achieved by negotiating a reduced price for the Mechanical Universe series, which normally would have cost $225 per copy. Many of the demonstration supplies and print materials were purchased at substantial discounts as well.

3. ***Budget Equity.*** Except for a few Mentor Teachers, teachers were selected to participate based on lack of experience in teaching physics. Teachers without a degree in physics, or with only emergency credentials were given priority in signing up. Any remaining vacancies were filled on a first-come first-served basis.

4. ***Budgeting Procedure.*** Each CSU campus spent their $15,000 grant somewhat differently. Overall, approximately two thirds of the budget was spent on teacher stipends, materials, equipment, the Mechanical Universe tapes, and expenses with the remainder being spent on professor honoraria and administration costs. Professor time was essentially donated to the project since the honoraria were very small.

VI. Outcomes

All of the project objectives were at least partially attained (Collea, 1988). Ninety inexperienced physics teachers received extensive training and a variety of instructional resources to improve their teaching skills and knowledge of physics. Each teacher received a copy of the high school version of the Mechanical Universe series and appropriate training and sample lessons for effectively integrating it into the high school physics curriculum. The CSU campuses that conducted formal evaluations received overwhelmingly favorable responses from the teachers, with most teachers expressing an interest in attending future summer institutes.

VII. Current Status

Two of the institute sites received federal grants and continued training high school physics teachers in the use of the *Mechanical Universe* series and instructional aides.

VIII. Strengths/Facilitating Factors

- The *Mechanical Universe* videotapes and materials were provided to the project by Caltech at a greatly reduced cost. Many of the demonstration aids were also procured at greatly reduced prices.
- This project was reported to meet many of the needs of inexperienced high school science teachers and those who were not credentialled to teach physics.
- The CSU campuses that conducted formal evaluations of the institutes received overwhelmingly favorable responses from the teachers, with most expressing an interest in attending future summer institutes.
- Extensive information was developed and provided for the integration of the *Mechanical Universe* series with the high school physics curriculum.

IX. Weaknesses/Constraints

- The institute organizers felt that the $15,000 grants were much too small; some were unable to provide teachers with extensive demonstration equipment and others had to charge extra for it.
- Possible outcomes of the institutes, particularly the use of the knowledge and materials provided by teachers in classroom instruction, were not evaluated.

X. Recommendations/Promising Practices

- Staff development opportunities related to the Mechanical Universe and a program of extensive follow-up activities should be provided for teachers who are inexperienced or not credentialled in the subject they are teaching.
- Because of anecdotal reports on the success of this project, it should be revisited for possible expansion as a model for expanding teacher knowledge and skills.

Developmental Grants Program

I. Background

Program History. The California Department of Education (CDE) awarded Assembly Bill 803 grants under the Developmental Grants Program to districts and counties to support development of programs that would address the critical needs of curriculum and instruction in California schools, using technology as a tool (CDE, 1985a). The program was called the Critical Needs Developmental Grants Program in the CDE's *Sunset Report for Assembly Bill 803.*

Another program, the Dissemination Program, was established to support outreach efforts by the developmental projects that were considered successful. This program is described in detail in the Dissemination Grants section of this report.

The developmental and dissemination grant programs, both competitive in nature, were intended to promote the integration of educational technology throughout the curriculum and to develop models for adoption by other districts and schools throughout the state. Due to budget cutbacks, both the developmental and dissemination grants programs were discontinued on July, 1987.

Legislative Authority. The precursors of the developmental grants program were part of a group of projects, extending as back as far as fiscal year 1982-83, under the previous educational technology legislation, Assembly Bill 2190. Grants had been awarded to local education agencies by the CDE in response to unsolicited proposals that were recommended by the Educational Technology Committee.

II. Program Purpose and Objectives

In the application guidelines for the Developmental Grants Program (fiscal year 1984-85), applicants were notified that this program was designed to:

- foster comprehensive programs which integrate the use of technology throughout the school curriculum;
- encourage the development of innovative educational technology programs which use telecommunications and electronic technology to enhance the learning process and which have the potential to be models for other districts and schools; and
- support efforts which will ensure more equitable access to educational programs which improve students' knowledge and skills in the use of technological equipment.

School districts and county offices of education applying for grants were advised to consider their particular curriculum priorities and areas of student achievement that most needed improvement. Then, consistent with the assessment, applicants were encouraged "to develop innovative programs in which technology would be used to enhance the learning of specific groups of students, to enrich particular subject areas in which students are not achieving adequately, and to facilitate innovative organizational arrangements which will promote individualized instruction and equitable use of technology."

III. Priorities and Restrictions

In preparing grant proposals, applicants were advised to emphasize elements of local instructional programs in which technology, integrated as a strategy to achieve instructional objectives, could serve as a tool for enhancing the entire curriculum.

Local education agencies applying for the first cycle of developmental grants were advised that the projects were expected to extend over a two to three year time period to determine the impact of the project program on students and staff. Due to the timing of the first funding cycle, applicants were required to submit two budget proposals; the first for the remaining two months of fiscal year 1984-85 and the second for the entire fiscal year 1985-86. These grant awards allowed the program's services to continue through June 30, 1986.

Finally, to emphasize the curriculum development focus of the grant program, first-year expenditures for equipment were to be limited to 50 percent of the total budget.

IV. Program Development

Project Emphases. Each of the AB 803 developmental grant projects was required to draw up an action plan that addressed how the proposed project would address local curriculum and instructional priorities while, at the same time, take into consideration other state-wide reform initiatives and priorities. Applicants were provided with draft versions of "point of view" statements about the major curriculum areas and were referred to CDE publications that dealt with curriculum improvement. Applicants were given wide latitude in establishing the proposed projects. Among the elements addressed were:

1. ***Curriculum***. No specific grade levels or subject area priorities were established by the CDE for the developmental grants program. Grant applicants were expected to assess instructional needs and relate the identified need to the district's overall effort to improve curriculum and instruction. Districts were expected to demonstrate that their proposed projects clearly supported the board-approved plan for computer education or educational technology. The program application guidelines provided an example of an approach considered appropriate:

   > *A project which uses computers in a revision of a district's K-8 math curriculum, to be consistent with the new math [curriculum] framework, and which involves more than one school in a feeder system.*

2. ***Staff Development***. Applicants were required to prepare plans for how the proposed project could serve as a model for other schools with similar needs.

3. ***Learning Resources Management.*** The developmental grants program application guidelines placed strong emphasis on including other learning resources in project planning. Applicants were required to conduct school level inventories of equipment and software and to specify how the grant would be used to add to the existing resource base. Additionally, grant proposals were expected to describe how appropriate outside public and private agencies were involved in planning the program.

4. ***Dissemination***. While the immediate emphasis of the developmental grants projects was on the development of innovative applications of technology to curriculum improvement, the emphasis on local district institutionalization and the development of project models that were suitable for adoption by other schools with similar needs was

central to the program. Funded projects were expected to document their activities so that the results could be shared with potential adopters.

5. ***Evaluation***. Applicants for the original developmental grants were required to prepare evaluation plans that would provide both ongoing information (formative feedback) and measures of program success (summative evaluation). Those proposals had to provide clear plans of how the projects would assess the impact of the programs on participants. Developmental grant proposals had to respond to the following guidelines:

> *It is necessary for you to report on the effect of your program on its primary audience, i.e., teachers, parents, students, etc. Reporting on a secondary audience, such as students in a staff development project, could be important and data reported can range from records to pre-post testing with standardized tests. If instruments used in your assessment are not commonly known you should describe them in your application.*

V. Program Implementation

Grant Awards. The AB 803 developmental program grants were competitively awarded as follows:

Project Title	District/County Office
Interactive Video System for Science	Vallecito Union School District Murhpys (Calaveras County)
Project On-Line	Madera Unified School District Madera
Language Arts Technology Curriculum	Alhambra School District Alhambra
Voice Activated Computers for the Handicapped	Los Angeles County Office of Education Downey
Successful Math, Successful Student	Los Angeles Unified School District Los Angeles
Critical Thinking Instruction with Computer Assisted Learning (CRITICAL)	Corona-Norco Unified School District Corona
Computerized Cross-Age Writing	Riverside Unified School District Riverside
Project Pericles: Political Behavior in California	Escondido Union High School District Escondido
Science Curriculum Enhancement Through Application of Electronic Technology	La Mesa-Spring Valley School District La Mesa
Developmental Grant Program—Elementary	San Diego Unified School District San Diego
Computer-Assisted Language Learning (CALL)	Alum Rock Union Elementary School District San Jose
The Fourth R — Reasoning	Berryessa Union Elementary School District San Jose
Technology Improves Communication Skills	Sonoma County Office of Education Santa Rosa

The initial developmental grants supported project operations from May 1, 1985, until June 30, 1986. All of the projects were refunded for a second year of development activities with 1986-87 fiscal year AB 803 funds. In July of 1987, the Governor vetoed half of the educational technology budget and the developmental and dissemination grant programs were discontinued. None of the promising products or practices resulting from the developmental grant projects funded under AB 803 were ever disseminated.

VI. Program Support Resources

Local and State Support. The developmental grants program required local educational agency applicants to provide matching funds equal to or exceeding ten percent of the total funds requested. This requirement ensured that the district or county office applying for the developmental grant was willing to commit local resources towards the success of the project.

State funding was intended to be sufficient for demonstrating that the program does have an impact on participating students and will be useful as a model for other local education agencies. The grant application guidelines advised schools as follows:

> *Thus, a program might reasonably propose to serve all students in a school (particularly in a rural setting or with a multiple-technology program) or perhaps all students in several grades in different schools. A program designed to serve all students in a large urban district likely would not be necessary to demonstrate the success of a particular program and thus the cost would probably be judged unreasonable. Moreover, in light of the requirement for a 10 percent match on the part of the applicant, a district-wide program in the case of a very large district may prove to be too costly.*

VII. Program Funding Resources and Constraints

1. ***Program Budget.*** As reported in the CDE's AB 803 Sunset Report, expenditures of AB 803 Educational Technology Local Assistance Program funds for the developmental programs between fiscal years 1983-84 and 1986-87 were as follows:

	1983-84*	1984-85**	1985-86	1986-87
Expenditures	$ 2,155,903	$ 983,638	$ 0	$ 1,000,000

*$1,015,532 in 1983/84 were carry over from AB 2190 and AB 3266 funds
**Fifteen month funding to carry projects through 1985-86

2. ***Cost Benefits***. The CDE envisioned a multiplier effect of the amounts invested in the two programs through adoption and adaptation of the programs by schools throughout the state.

3. ***Budget Equity***. While the developmental grant recipients tended to be located in or near major urban areas, with high technology businesses or research institutions nearby, the benefits of the programs were open to all schools in the state.

4. ***Leveraging and Institutionalization*** Developmental grant projects were responsible to document the outcomes of their programs so that they could readily serve as models for other schools during the dissemination grant phase.

5. ***Budgeting Procedure*** The competitive grant programs instituted under AB 803 included systematic budget procedures and 10:1 matching grant requirements. These procedures ensured systematic planning and fiscal accountability.

VIII. Outcomes

All of the AB 803 developmental grant program projects were funded for a second year of development activities and prepared dissemination materials in preparation for consideration for grants under the dissemination grant program. As mentioned earlier, none of the developmental grant projects were able to conduct any outreach activities because both the developmental and dissemination grant programs were discontinued when the Governor eliminated the TEC Centers and vetoed half of the AB 803 budget in July of 1987.

IX. Current Status

None of the developmental grant projects presently receives support form the CDE although some may share their proven products and practices with other schools through informal exchanges and continue activities with local or other state funds. To some extent the Level II Academic Model Technology Schools projects and the AB 1470 R&D grants replace developmental/dissemination programs.

X. Strengths/Facilitating Factors

- Schools were provided with the opportunity and incentive to develop new and innovative strategies for integrating technology with the curriculum.
- Reports from developers indicate that potential promising practices and products may have resulted from these projects

XI. Weaknesses/Constraints

- Due to budget cuts, these AB 803 projects were discontinued before they could be completed and validated.
- Standards for development and validation were incomplete.
- Because they were not completed, none of the promising products or practices resulting from the developmental grant projects funded under AB 803 were funded for dissemination.

XII. Recommendations/Promising Practices

- A developmental grants program should be considered to stimulate the development of innovative strategies and products for integrating technology with the curriculum and to create models that could be adopted by other schools.
- The forms and procedures applied to the developmental grants should be revisited for application in the current AB 1470 Research and Development program.

Dissemination Program Grants

I. Background

Program History. The Dissemination Program provided grants from the California Department of Education (CDE) to projects located in districts or counties to support the dissemination of programs that addressed critical student needs. The major objective of the program was to transfer successful products and practices to other schools with characteristics similar to those of the original development project.

The dissemination grants were awarded to projects that were judged to have been successful in implementing the provisions of educational technology developmental grants. Among these was the Developmental Grants Program that is described in the previous section of this report. Both the developmental and dissemination projects were considered important elements in the overall CDE strategy to promote the integration of educational technology throughout the curriculum and develop models for adoption by other districts and schools throughout the state. The developmental and dissemination grant programs were discontinued in fiscal year 1987-88.

Legislative Authority and CDE Guidelines. The developmental and dissemination grant programs stemmed from several unsolicited grants, extending back to 1982-83, that had been issued by the CDE under the previous educational technology legislation, AB 2190. In implementing Assembly Bill 803, the CDE used both carry over funds from Assembly Bill 2190 and Assembly Bill 3266 and start up funds from the 1983-84 fiscal year AB 803 appropriation to award second-year grants to 14 dissemination projects and first-year dissemination grants to an additional 14 projects.

Eleven of the 28 original developmental/dissemination (AB 2190) projects received additional dissemination grants from fiscal year 1985-86 AB 803 funds and ten were funded to continue outreach activities in fiscal year 1986-87.

II. Program Planning

Program Purpose. The dissemination program grants were awarded to enable developmental projects that were deemed successful to provide other school and education agencies with assistance in adopting or adapting the innovative products or practices developed by the project. In effect, the dissemination grants program was designed to extend the benefits of developmental grant support to other California schools.

Planning Priorities. In their outreach planning, the dissemination projects were to provide several types of outreach support, including:

- Awareness of programs through appropriate written material and presentations
- Necessary training for project implementation
- Quality implementation materials
- Technical assistance and/or "coaching" as needed to facilitate project adoption/expansion

III. Program Description

Project Emphases. In preparing applications for support as dissemination projects, staff of the developmental projects had to create detailed plans for providing both information to create awareness about their projects and intensive staff development activities for adopters of the project innovations. The CDE required dissemination projects to provide plans detailing how the project staff would provide for the following elements:

1. ***Curriculum.*** The application guidelines for the 1987-88 dissemination grant program required applicants to develop a description of the existing project that provided a clear understanding of the critical curricular elements and strategies used in the program. Potential adopters would need to know what curricular and instructional needs had been addressed by the original developmental project and how technology was used as a tool in implementing the project.

2. ***Staff Development.*** Dissemination grant applicants were required to prepare plans describing how the technology-based instructional or staff development program of the proposed project would serve as a model for other schools with similar needs. The grant application guidelines required each project to propose an "adopting staff training requirement" as follows:

   > *Briefly describe or outline the general training requirements for an adopting school staff to successfully implement your program. Include the follow-up technical assistance that could be expected in most instances.*

3. ***Learning Resources Management.*** Before they became eligible for dissemination grants projects had adhered to the developmental grants program application guidelines that placed strong emphasis on including other learning resources in project planning. Applicants were required to conduct school level inventories of equipment and software and to specify how the grant would be used to add to the existing resource base. Additionally, developmental grant proposals were expected to describe how appropriate outside public and private agencies were involved in planning the program.

4. ***Dissemination*** Staff development and outreach activities were the most important elements of the dissemination grants program. Emphasis on local district institutionalization and the adoption of project products and practices by other schools with similar needs was also emphasized. Dissemination projects were expected to provide a timeframe for the following:

   - Preparation/publication of materials
   - Awareness activities such as, distribution of materials, presentations to selected audiences, hosting visitors, etc.
   - Training TEC Center staff
   - Distribution of student and teacher materials
   - Conducting follow-up technical assistance (coaching)
   - Evaluation

IV. Program Implementation

1983-84 Project Grants. Using both carry over funds from AB 2190 and AB 3266 and start-up funds from fiscal year 1984-84 appropriation for AB 803, the CDE, awarded 6 "Second Year Staff Development Dissemination Grants," 8 "Second Year Educational

Technology Dissemination Grants," and 13 "First Year Dissemination Grants." The first developmental project grants under AB 803 were awarded by the CDE in April of 1985. The Second-Year Staff Development Dissemination Grants, for six projects originally funded under AB 2190, were awarded to:

Project Title	District/County Office
Cooperative Project for Teaching for Thinking	Orange County Office of Eduction Costa Mesa
COACH—Comprehensive On-going Assistance to Improve Curriculum & Instruction Through High Technology	Newport-Mesa Unified School District Newport Beach
GPSI—Generic Problem-Solving Instruction	Tri-Tec Center, Ventura County Office of Education Ventura
Articulation and Improvement of Science, Math and Technology at the Secondary and Post-Secondary Level	South San Francisco Unified School District and Skyline Community College South San Francisco and San Bruno
Cadre of Computer Curriculum Specialists	San Francisco State University San Francisco
North Costal Math/Science Network	San Diego County Office of Education San Diego

The Second Year Educational Technology Dissemination Grants were awarded to the following eight projects originally funded under AB 2190:

Project Title	District/County Office
MOST-TEC—Maximizing Opportunity for Students and Teachers Through Technology	Fresno County Office of Education Fresno
EAT—Elementary Aerospace Technology	Los Angeles Unified School District Los Angeles
Computer Literacy for Elementary Schools	Los Angeles Unified School District Los Angeles
Teaching Writing and Problem-Solving With Computers	Goleta Union Elementary School District Goleta
PASS on PASS—A Microcomputer-Based Interactive Video/Instructional Materials Creation Training	Stanislaus County Office of Education Modesto
The Peninsula Academies	Sequoia Union High School District San Mateo
CLEATS—Computer Literacy — All Teachers and Students	Los Angeles Unified School District Los Angeles
Cupertino Computer Literacy Project	Cupertino Unified School District Cupertino

The third category of dissemination projects, First Year Dissemination Grants, were awarded to 13 projects that had been supported by AB 2190 grants; these were:

Project Title	District/County Office
Incorporating New Technologies Into Existing School Curriculum	Vallejo Unified School District Vallejo
Cable TV Modules: Computer Education Staff Development	RETAC (Regional Educational Television Advisory Council), Los Angeles County Office of Education, Downey
Critical Thinking Skills: Correlation of Software with the School Curriculum	South San Francisco Unified School District South San Francisco
Logo as a Tool in Physics Education	Rio Linda Union Elementary School District Rio Linda
Computer Education Staff Development Modules	Teacher Education and Computer Center 8 Santa Clara County Office of Education San Jose
Instructional Modules for Computer Literacy Classes	Santa Clara County Computer Education Consortium, Santa Clara County Office of Education, San Jose
Computer-Based Instructional Modules for Science	Santa Clara County Computer Education Consortium, Santa Clara County Office of Education, San Jose
Research Project: Social and Motivational Consequences of Computer-Based Learning	Stanford University Stanford
The California Forum — High School Version	University of California Berkeley
Science Education: Correlations of Instructional Television with School Curriculum	KQED, Inc. San Francisco
Thinkware: Computer-Based Learning	Cognitive Learning Associates
Model Learning Laboratory for Low Achieving Elementary Students	Ocean View Elementary School District Huntington Beach
Computer Development	Institute for Computer Technology

AB 803 Grant Awards. Of the developmental projects originally funded under AB 2190, those listed above received dissemination grants in 1983-84 and 1984-85. Eleven were judged to be particularly effective and were awarded AB 803 dissemination grants in fiscal year 1985-86. These projects "packaged" their programs, often with "catchy" new titles, and prepared teacher guides and classroom packets in forms suitable for adoption by other schools and districts. The instructional materials, and staff development workshops conducted throughout the state, were provided at reasonable cost to interested districts and schools. In addition, the dissemination workshops were

incorporated in the staff development programs of the 15 Teacher Education and Computer Centers (TECCs). Eleven grants were awarded as follows:

Project Title	District/County Office
California Impact: Teaching for Hi Tech Thinking	Huntington Beach Union High School District Huntington Beach
The Cupertino Concept: Computer Literacy and Beyond	Cupertino Union School District Cupertino
CompuTHINK: Educational Tech-Technology for Critical Thinking	South San Francisco Unified School District South San Francisco
EAT: Elementary Aerospace Technology	Los Angeles Unified School District Los Angeles
Teaching to the Third Power	Goleta Union School District Goleta
Schooling the Microcomputer	Los Angeles County Office of Education Downey
Let's Talk Computers in Writing	Ocean View School District Huntington Beach
Project Coach	Newport-Mesa Unified School District Costa Mesa
San Diego Math Network	San Diego County Office of Education San Diego
Computers and Kids	Los Angeles Unified School District Los Angeles
GPSI—Generic Problem-Solving Instruction	Ventura County Office of Education

A year later, dissemination grants from AB 803 fiscal year 1986-87 funds were made to ten of the exemplary projects; the Ventura County Office of Education's GPSI project was not continued. In July of 1987, the Governor vetoed half of the educational technology budget, and the dissemination grants program was discontinued. None of the developmental grant projects funded by AB 803 were ever able to disseminate their promising products or practices.

V. Program Support Resources

Local and State Support. During the time that the dissemination projects were receiving support under the developmental grants program, they had been required to provide matching funds equal or exceeding ten percent (10:1 match) of the total funds requested. This requirement was continued on into the dissemination program phase and ensured that the district or county office applying for grant support was willing to commit local resources to the success of the project.

VI. Program Support, Resources and Constraints

1. ***Program Budget.*** As reported in the CDE's AB 803 Sunset Report, expenditures of AB 803 Educational Technology Local Assistance Program funds for the dissemination grant program for fiscal years 1985-86 and 1986-87 were as follows:

	1985-86	1986-87
Expenditures	$390,475	$500,000

The funding for 1983-84 activities, a year of transition in which the AB 2190 Educational Technology Committee served through calendar year 1983 and the AB 803 committee assumed office in January of 1984, was just over one million dollars. The source of the funding was:

$ 870,000	Governor's budget
52,200	SB 813 COLAs
210,480	AB 803 start-up funds
$ 1,132,680	Total

A majority (86%) of the 1983-84 AB 803 funding went to the dissemination grant programs. In contrast, the 1984-85 budget for AB 803 was $15,000,000 of which $1,000,000 was allocated for both the development and dissemination grant programs, less than seven percent of total.

2. ***Cost Benefits.*** The CDE envisioned a multiplier effect of the amount invested in the dissemination projects through adoption and adaptation of the programs by schools throughout the state.
3. ***Budget Equity.*** While the development and dissemination program grant recipients tended to be located in or near major urban areas, with high technology businesses or research institutions nearby, the benefits of the programs were open to all schools in the state.

4. ***Leveraging and Institutionalization*** Dissemination grants were expressly charged with extending the benefits ("leveraging") of the CDE's original investments.

5. ***Budgeting Procedure*** The competitive grant programs instituted under AB 803 included systematic budget procedures and 10:1 matching grant requirements. The procedures ensured systematic planning and fiscal accountability.

VII. Outcomes

The dissemination grant program was discontinued when the Governor eliminated the TEC Centers and vetoed half of the AB 803 budget in July of 1987.

A report of the activities of the dissemination projects that had been funded earlier under AB 2190, however, provides one indication of the effects of the program. Nine of the ten 1986-87 projects submitted applications for 1987-88 AB 803 grant funding and reported on their levels of outreach activities between July 1, 1986 and April 30, 1987 as follows:

- Presentations were made to 372 groups, including 7,434 educators from 2,394 schools
- Information materials distributed totaled:
  - 24,239 Project brochures
  - 3,348 Training manuals
  - 2,143 Teaching Guides
  - 1,279 Student manuals
- Seven projects made 323 site visitations, meeting 4,139 educators in 370 schools, to provide basic information on project programs
- Eight projects provided 219 adoption/adaptation training sessions for 2,336 educators in 883 schools
- Seven projects gave 414 technical assistance/coaching sessions for 704 educators in 293 schools

VIII. Current Status

None of the former developmental or dissemination grants program projects presently receives support from the CDE although some of them may still be active in working with other schools to implement the proven products and practices. The Model Technology Schools programs, Level I and II, have replaced the developmental/dissemination grants programs.

IX. Strengths/Facilitating Factors

- The program capitalized on the strengths of previously developed and successful projects by disseminating effective products and practices throughout the state.
- Collaboration with the TEC Centers provided a cost-effective means for dissemination of the model programs and materials.
- Presentations were made to more than a quarter of the schools in California and tens of thousands of brochures were distributed.
- Thousands of educators at hundreds of schools were trained by these projects.
- Over 30% of the AB 803 Adoption/Expansion Grants were adaptations of the Dissemination projects.

X. Weaknesses/Constraints

- Due to budget cuts, the AB 803 projects were discontinued before their state-wide impact could be assessed.
- The dissemination program was not well coordinated with existing staff development and regional service agencies.

XI. Recommendations/Promising Practices

- Incentives should be considered for the "packaging" and dissemination of the innovative practices developed by the current School-Based Educational Technology Projects.
- A state-wide clearinghouse and database of "successful" technology-based material and practices should be established and maintained in collaboration with the Subject Matter Projects, county offices of education, CTP, and ITV agencies.

- A dissemination grants program should be reestablished to enable schools to adopt and/or adapt successful models of innovative strategies for integrating technology with the curriculum.

Adoption/Expansion Grant Program

I. Background Information

Program History. Among the major initiatives of the Educational Technology Local Assistance Program, Assembly Bill 803, the Adoption/Expansion Grants Program received the largest share of annual appropriations. The Adoption/Expansion Grant Program had the broadest impact, directing more than half of all the state educational technology funding in California to small school-level grants.

Between 1984 and 1989, $53.6 million in Adoption/Expansion Grants, ranging from $8,000 to $24,000, were awarded on a competitive basis to 5,638 schools during five years of funding. During the first two years, grants for elementary schools were limited to $8,000 and grants to secondary schools were limited to $12,000. In subsequent years, the maximum grant levels were raised to $17,000 and $24,000 respectively to accommodate the needs of larger schools, although the allocations were set using an incremental scale based on school size.

The 5,638 schools that received AB 803 Adoption/Expansion Grants represented over 70% of the total number in the state and over 80% of the number of schools which had applied for program funding. During the first three cycles of the program, the state-wide network of regional Teacher Education and Computer Centers (TECCs) provided (1) projects with staff development services, (2) local administration of the project grants, and (3) technical assistance to schools wishing to participate in the educational technology program.

In administering the Adoption/Expansion Grant Program over the first four years of funding, the CDE developed and implemented requirements for projects to increase attention to staff development and the evaluation of project outcomes. In the summer of 1987, though, the Governor vetoed all of the funding for the TECC program and half of the funds that had been allocated for the fourth year of projects. In year five, the CDE selected previously unfunded applications from year four for funding instead of soliciting a new round of proposals.

Legislative Authority. The first set of "Application Guidelines and Forms for the Educational Technology Local Assistance Program" released by the CDE (1984a) on October 2, 1984, "for the competitive grant program authorized under Assembly Bill 803," referred to *Adoption/Expansion programs*, not in the title but in a section on the "Nature of Program Grants." The program became formally known as the Adoption/Expansion Grants Program in the year two guidelines (CDE, 1985b). AB 803 authorized the Superintendent of Public Instruction to work with the Educational Technology Committee to develop a system and criteria for awarding grants as follows:

> *A school district shall be eligible to apply for an educational technology local assistance program matching grant which provides ten dollars ($10) of funding for every one dollar ($1) provided by the school district for any of the following purposes:*
>
> 1. *The use of educational technology in the programs of the school district.*
> 2. *Any use of computers in the school district's instructional programs.*
> 3. *A proposed reading, math, or science project meeting specified criteria.*

The AB 803 Adoption/Expansion program was intended to provide individual schools with funds to begin modest applications of technology (by adoption or adaptation of successful products or

practices or by expansion of existing local efforts) to the curriculum. AB 803 defined educational technology to include "electronic systems, such as television, radio, computers, and other emerging state-of-the-art equipment, used for classroom instruction."

II. Program Planning

Program Goals. Neither AB 803 nor the *Sunset Report on Assembly Bill 803* prepared by the CDE's Office of Educational Technology on the legislation stated *specific* goals and objectives for the Educational Technology Local Assistance Program. However, the CDE's Application Guidelines and Forms for the Educational Technology Local Assistance Program for Cycle I, 1984-84 (CDE, 1984a), gave "three general purposes" for the program; these were:

- To encourage all districts to consider adopting an existing effective technology "model" program which is closely related to the needs and priorities of the applicant's schools;
- To promote school level planning for and implementation of educational technology programs which meet the learning needs of students as determined by teachers, administrators, and parents in that school's community;
- To support relatively small-scale start-up or expansion efforts that are developed in concert with other resources available in a school or district (School Improvement, staff development, mentor teachers, classroom teacher mini-grants, ESEA Chapter II, etc.)

Project Planning. The application procedures for Adoption/Expansion Grants were designed to stimulate district planning for using technology in instructional improvement and to link school planning with district planning. School districts were required to develop comprehensive plans for the use of educational technology in district educational programs. The RFPs for the program required that technology use plans "be developed in cooperation with parents, teachers, students, administrators, regional organizations, and, where possible, representatives from local business and industry in technological fields." School planning was expected to be consistent with the district's comprehensive technology and/or computer plan. A district's technology plans were to include at least the following components:

1. A needs assessment process that included an analysis of existing educational technology programs already in place in the district.
2. A statement of the district's program philosophy and goals, along with objectives for implementing the educational technology program (these could be long term in nature assuming that the program would be phased in during a 3-5 year period). The educational technology plan and program would best be developed or refined as part of the larger planning effort to upgrade the curriculum.
3. An assessment of inservice training needs associated with the educational uses of technology and a process for meeting those needs in both the short and long terms.
4. Strategies for providing equitable access to educational technology programs to students throughout the district, including district needs for acquiring sufficient hardware and courseware to allow enough available time for "hands-on" use of equipment in each school. Districts were advised to be concerned with more subtle issues such as the possibly inappropriate structuring of the curriculum for higher achieving versus lower achieving students, access for female and male students, and perhaps after-school/home use of equipment for students who cannot afford to purchase their own equipment or who are bussed to school.

The criteria for rating Adoption/Expansion Grant proposals also provided guidance for school level project planning. The criteria included the following:

1. The needs of students and staff to be addressed by the proposed program are clear and are based on an assessment of student and staff performance.
2. The program objectives are clear and directly related to the identified student and staff needs.
3. The proposed program activities are directly related to the objectives.
4. School level responsibilities for program coordination and implementation are described.
5. The evaluation plan for the proposed program includes both a review of implementation activities and strategies to measure the results of the program.
6. The proposed budget, including matching funds, is directly related to the proposed program activities.
7. The proposed program objectives and activities are consistent with the district's comprehensive technology and/or computer plan.

III. Program Development

Program Emphases. Given the large number of individual grants awarded, it is obvious that the projects varied considerably in scope and in specific objectives. The following describes the extent to which the Adoption/Expansion Grants Program emphasized state priorities.

1. ***Curriculum.*** Schools were expected to identify and address curriculum needs in the applications of technology. The CDE expected the grants to be "curriculum-driven" rather than technology-driven. The grant application included sections dealing with school, student, and teacher needs. These focused on curriculum needs at the school, often stated in terms of standardized test scores. The application process also required specific objectives and activities to support both staff and student expected outcomes.

2. ***Staff Development.*** Starting in 1985, the CDE began requiring the Adoption/Expansion Projects to allocate at least 10% of grant funds to staff development. This was in recognition of the fact that teachers generally needed adequate time and training to successfully implement new technology programs.

3. ***Learning Resources Management.*** There was no formal requirement for schools to address learning resources management as part of the application procedure. As an initial step in gathering information for future planning, schools were asked to attach an inventory of existing equipment and software at the school site. However, grant applicants were asked to specify the individuals at both the district and project site who were to be responsible for implementing various parts of the plan.

4. ***Dissemination.*** The Adoption/Expansion Projects were not expected to disseminate any features of their programs. The CDE was already funding the dissemination of several projects supported by AB 803 and the previous educational technology legislation, AB 2190 (see separate reports on Developmental Grants Program and Dissemination Program Grants). The intent was to facilitate local adoption of those programs through the AB 803 Adoption/Expansion Grants.

5. ***Evaluation.*** Each AB 803 Adoption/Expansion Grant Project was to develop a plan to evaluate the outcomes of the project. A major criticism of the Adoption/Expansion Program, that evaluation was weak, is discussed below in section VII. Outcomes.

IV. Program Implementation

Project Activities. There were five years of Adoption/Expansion Grants but only four state-wide grant competitions. The typical elementary school AB 803 Adoption/Expansion grant recipient, according to the Legislative Analyst (in *A Sunset Review*), used its $8,000 grant "to purchase five computers, about $1,300 worth of instructional materials (mostly computer software), $500 for video equipment (TV monitors and VCRs), and $550 for staff training. . . most likely focused on teaching writing in grades 3 through 6." The typical secondary school grant of $16,000 was used "to purchase seven computers, $2,300 worth of instructional materials, $1,000 worth of video equipment, and $250 in staff development" and was most "likely to have been focused on a specific curriculum area, such as writing, math, or computer awareness."

Year I (1984-85). The CDE awarded grants to 1,002 schools out of the 2,685 that applied for the first round of grants, 37% of the total. This represented 12.5% of the 8,005 eligible schools, which included Special Education Centers, ROPs, etc.
Year II (1985-86). A total of 1,841 of the 2,656 schools applying for Adoption/Expansion grants, or 70%, received grants in the second year, the highest percentage in any one year. This represented 22.3 percent of all schools in the state.

Year III (1986-87). Out of the 2,382 schools that applied for the third year, 1,504, or 53.3%, received grants, the second highest level of awards in this program. The 16.5 percent of schools brought the cumulative total of all eligible schools that received grants to 51.9%.

Year IV (1987-88). Of the 2,297 applications for grants, the CDE was able to make awards to 753 projects. Only 33% of the applicants received grants because the Governor had vetoed 50% of the funding for educational technology programs. The fiscal year 1987-88 funds originally allocated for district and county grants, $13,500,00, were reduced to $6,589,623. (See VI. Program Support, below, for a summary of program funding over the five cycles.)

Year V. Fiscal year 1988-89 funds were awarded to 492 Adoption/Expansion projects. Because of the discontinuance of the TECCs and the reduction in educational technology funding in the summer of 1987, the year V projects, however, were not chosen through a state-wide competitive process. Rather, the 492 top-rated applications from the 1,544 proposals that had not been funded in the previous year received grants.

Program Award Data. In addition to the data reported in the table above, the CDE's *Sunset Report on AB 803* also provides detailed analysis of several breakdowns of Adoption/Expansion Grant award data, including a summary of dollars applied for and dollars awarded; summary of LEAs applying for and receiving grants by TECC Region; the total number of funded elementary and secondary schools, and the totals by application cycle.

V. Resources to Support Adoption/Expansion Program

Support Factors. The Adoption/Expansion Grant program was one of the major thrusts in the AB 803 initiatives. The bulk of all Educational Technology Local Assistance Program funding, over 58% of the total of $91.8 million, was awarded to schools and school districts through Adoption/Expansion Grants. The AB 803 goal to promote the use of technology in educational programs was approached through grant application guidelines requiring district plans which stressed combining AB 803 grant funds with other federal and state supported programs and curriculum reform efforts already under way.

Adherence to the AB 803 goals of reaching as many schools as possible and of providing equitable access to grant funds was always stressed by the Educational Technology Committee. In an effort to provide schools with assistance in applying for Adoption/Expansion grant support, the Office of Educational Technology worked with the Office of Staff Development to set up mechanisms whereby the Teacher Education and Computer Centers could provide direct support to schools in their regions. The CDE allocated AB 803 funds to provide supplemental grants to the TEC Centers to administer the regional competitions for each cycle of funding in an effort to ensure equitable access throughout the state.

Until the regional support agencies were discontinued in the summer of 1987, each TECC conducted evaluations of grant applications in which local readers scored proposals using criteria developed by the CDE and rank-ordered the applications based on the ratings. Grant funds were allocated to each regional TEC Center based on the portion of state-wide ADA. TECC Policy Boards were authorized to subdivide the regional allocations by counties or other established sub-regional divisions.

Adequacy of Resources. After the TEC Centers were discontinued in the summer of 1987, the Adoption/Expansion grant projects were left without regional support services. As noted above, the funding was also reduced for the local projects, from an anticipated $13 million to $6.6 million. In coping with the budget shortfall, the CDE divided funding for the projects into two phases; the first 124 schools were funded prior to June 30, 1987, with $1.2 million that had not been expended from fiscal year 1986-87 funds; the second group of 629 sites were awarded grants from fiscal year 1987-88 funds, after September 1 of 1987.

In fiscal year 1988-89, the CDE awarded almost $5 million in Adoption/Expansion Grants. The awards, which went to 492 sites that were selected from among the higher-scoring applications of schools that had not been funded for the previous year were scheduled to operate from July of 1988 until September of 1989.

During all of this, there was a great deal of discussion about providing the newly funded Adoption/Expansion projects with support services. In February of 1989 the California Technology Project (CTP) was established and give the responsibility of coordinating AB 803 programs and supporting local Adoption/Expansion projects. The California Technology Project is the subject of another section of this report.

VI. Program Support, Resources and Constraints

1. Program Budget. The amounts of AB 803 funding expended in each of the five funding Cycles; the percent of the total AB 803 budget for the fiscal year; the number of school sites funded by the grants; the percent of the total of schools in the state which were funded in each year; and the amount of the supplemental grants awarded to the TEC Centers are shown in Table 5:

Table 5. Program Budgets

Grant Cycle/ Fiscal Year	Amount Expended	Percent AB 803	Number of Sites	Percent of Total
1984-85	$ 9,125,027*	59.5	1,002	12.5
1985-86	16,904,622	65.0	1,841	23.0
1986-87	14,855,216	60.0	1,504	18.8
1987-88	7,790,489**	53.6	799	10.0
1988-89	4,962,230	38.0	492	6.1
TOTALS	$ 53,637,584	58.4	5,638	70.4

* Includes $126,873 of fiscal year 1985-86 funds
** Includes $1,200,866 of reallocated 1986-87 funds

2. ***Cost Benefits***. While it was not a specific objective, the Adoption/Expansion Grant Program had some programmatic elements that tended to increase the overall cost-effectiveness of the projects. TECC Directors and AB 803 Coordinators reported that the Adoption/Expansion Grants stimulated the use of other funds for technology, both through matching requirements and subsequent expansion of projects with local funds. One of the stated purposes of the program was:

> *To support relatively small-scale start-up or expansion efforts that are developed in concert with other resources available in the school (school improvement, staff development, mentor teachers, classroom teacher mini-grants, ECIA Chapter II, etc.)*

3. ***Budget Equity***. As reported in the CDE *Sunset Report*, the Adoption/Expansion Grant awards were equitably distributed among all schools in the state, rural and urban, serving students in high to low socioeconomic areas. There had been serious questions, though, about the equity of grant awards and some State legislators asked for information about the distribution of grant awards. In a letter dated September 23, 1987, the Superintendent of Public Instruction wrote to several key members of the California Senate and Assembly to provide data about Adoption/Expansion Grant awards. The Superintendent cited a survey of schools which had never applied for an Adoption/Expansion grant and stated that:

> *The recommendations from this survey suggest that a sizeable minority of schools have found the process for obtaining an Adoption/Expansion grant beyond their often limited resources; nonetheless, computers have been acquired at most sites through other means.*
>
> *Using 2,518 as the number of schools which have never receive funds through the Adoption/Expansion program and $10,322 as the average amount requested during the most recent cycle of Adoption/Expansion grants, an estimated $26,015,976 would be required to fund all those schools which have never received funds.*

4. ***Leveraging and Institutionalization.*** Applicants for the Adoption/Expansion Grants were encouraged to adopt or adapt existing effective educational technology "model" programs that were closely related to the needs and priorities of their schools. The development of Adoption/Expansion project planning in concert with

other programs gave additional impact or leveraging of the outcomes of the separate programs.

5. ***Budgeting Procedure.*** All of the competitive grant programs implemented under AB 803 included systematic budget procedures and matching grant requirements (at a ratio of 10:1). These procedures were intended to increase the likelihood of systematic planning and promote district commitment to both implementation and continuation of the projects.

Regional Support Limitations. In the Superintendent of Public Instruction's letter to the State Legislature, quoted above, the negative effects that discontinuing the TEC Centers had on the Adoption/Expansion grant program was discussed. The Superintendent noted that "the absence of an in-place support structure with which to provide the administration, selection, technical assistance, and evaluation of grant programs" would be an important factor to be considered when the Legislature considered reauthorization of the educational technology program.

VII. Outcomes

Project Evaluation. One of the major criticisms of the Adoption/Expansion program is that it did not provide enough follow-through for the evaluation component. Although each grant applicant had to provide a brief plan for evaluation of the project, there was little follow-up, and therefore, little accountability. The CDE did, however, support one study of the impact of the Adoption/Expansion program.

CDE Program Evaluation Reports. The Office of Educational Technology summarized indicators of the impact on schools of the Adoption/Expansion program in the *Sunset Report for AB 803*. Data available after the first three years of project funding led the CDE to make the following conclusions:

- The initial impact of the Adoption/Expansion program has been to increase the availability of technology resources for curriculum and instruction: more technology, hardware, more software and improved staff readiness to utilize the technology. Data from schools funded in the first three cycles demonstrate these gains.
- Data on the average number of computers in schools before and after they received Adoption/Expansion Grants showed gains of 57% in elementary schools, 28% in secondary schools, and 39% overall.
- Correspondingly, the average number of students per computer before and after receipt of Adoption/Expansion Grants declined by 37% in elementary schools, by 21% in secondary schools, and by 28% overall.
- As specified in AB 803, the Adoption/Expansion Grant program was designed to ensure equitable student access to technology-based education, taking into account varied socioeconomic and urban rural differences. The geographic distribution of funds was ensured through the regional nature of the competition. An analysis by socioeconomic status (SES) of schools applying and schools funded, suggests that the characteristics of schools applying for funds and the characteristics of the schools being funded are representative of the schools as a whole. The SES indicator used for this analysis is that reported by each school in the California Assessment Program.
- Data on the curriculum areas most often addressed by the Adoption/Expansion Grant projects revealed that English-language arts was the curriculum area with the highest priority in both elementary (52%) and secondary (44%) schools. Math was in the top three priorities for 34% of elementary schools and 32% of secondary schools while reading had this priority for 38% of elementary schools and 27% of secondary schools. While overall

nearly 46% of schools ranked "Computer Awareness" among their top three priorities, further analysis of the data shows that computer awareness is nearly always the second or third priority, behind a curriculum emphasis.

- The Adoption/Expansion program has stimulated schools and districts to obtain or provide additional resources well beyond the district 10% match required. While a minimum of $3.9 million in district contributions has been generated in support of technology through the match provision, data from a variety of sources suggest that Assembly Bill 803 funds have generated additional support from sources such as local business and industry, school-site organizations such as parent clubs, and community service organizations. Funds and services from AB 551, school improvement, and other state-level funding sources have also been leveraged. AB 803, as indicated by surveys conducted in Los Angeles and San Diego counties, encouraged schools to aggressively seek out additional technology resources.

Other Reports. A TEC Center sponsored survey of 700 Adoption/Expansion Grant recipients in Los Angeles County conducted by Wulf (1986) reported similar findings about increases in the availability of new technologies in schools. The study also sought to identify factors to explain variation in success of project implementation, to assess perceptions about the relative impact of AB 803 on classroom instruction, and to develop baseline data for making recommendations about staff development for teachers and administrators in planning and implementing new technology.

The Wulf study examined the characteristics of Adoption/Expansion projects that reported high levels of impact on (1) student achievement and attitude and on (2) teacher use of technology in management and instruction. With regard to project effects on students, the report noted:

- Among successful projects there is a high level of teacher motivation among those involved in the project. Differences from less successful projects also appear in areas of instruction and in staff training.
- In terms of original objectives the more successful group cited "improving test scores" significantly more often than the less successful group. The high group also indicated critical thinking/problem solving as an area in which technology from the AB 803 project is most successfully utilized.
- The successful projects also reported using technology to teach new concepts; if objectives changed from the original project proposal, it was most likely to add "equal access/gender equity."
- In terms of learning environments, the successful projects report keeping the technological equipment in the library all or most of the time.
- Finally, the successful project personnel report experiencing a high level of training, that is, at the "classroom application" level, rather than at the "awareness," "concept development," or "skill development" levels.

On survey items for assessing changes in teacher competence in using educational technology in the classroom, Wulf reported:

- Secondary school (grade seven and above) projects were more often successful in increasing teacher competence in using technology than were elementary schools.
- The successful site is characterized by positive teacher and principal attitudes toward the AB 803 project. Not only is there a high level of teacher motivation and a very favorable principal's attitude, but there is also a commitment to AB 803 goals among the participating teachers.

- Successful sites reported that funding was substantial enough to achieve stated goals, and that the degree of difficulty in implementation of the project was low.
- In terms of instruction, successful sites reported that they used technology for teaching, e.g., drill and practice and for classroom management prior to AB 803 funding. They perceived that the curricular subject area where technology is most successfully utilized is written composition, and that, further, instructional activities have changed as a result of AB 803 funding, especially in students' achieving mastery on criterion referenced tests at a more rapid rate.
- With respect to what staff development content was dominant in the training, it was found that sites classified in the bottom 27% in development of teacher competence perceived "computer awareness/literacy use" to be more dominant than did those in the top 27%, indicating that the more successful might have progressed beyond such introductory training.
- Sites high in improved teacher competence were characterized by more total hours of training as a result of AB 803 planning and implementation. Nearly 71% of projects reporting 25-40 hours of training and 70% of those reporting more than 40 hours of training were in the high group.

A 1987 study of the impact of the AB 803 Adoption/Expansion Grant program funded by the CDE and conducted by staff members at the Far West Laboratory (Rockman, et al., 1987) concluded:

- The Adoption/Expansion Grants promoted school-level planning for, adoption of, and use of educational technology to meet local needs in elementary and secondary schools;
- Successful projects, those that created "a coherent system that used technology and increased the capabilities of students and teachers," "required a champion, or a group serving as the school's champion, with a vision of how technology might improve the instructional processes of the school. It further required staff capability — either existing in a staff member, or developed through inservice efforts — that was a catalyst in getting others at the site trained in the use of the technology. And it required a belief in district support — followed by evidence in the form of dollars, statements of priorities and commitment of district personnel;
- The outcomes of the Adoption/Expansion program are evident to the participants — teachers and administrators who wrote, implemented, and were the beneficiaries of the grants — but the outcomes are undocumented, unquantified, and often unquantifiable;
- Without the grant money, most of the schools (certainly not all) would still have purchased computers and/or video equipment, albeit to a lesser extent;
- The schools were best able to determine the best application of the Adoption/Expansion Grant — and other — funds from the district and the state that related to technology. In order to do this, schools had to clarify their their goals for the program, analyze effective approaches to implementation and develop clear planning procedures. That schools began thinking seriously about the appropriate uses of technology may be one of the more significant benefits of the Adoption/Expansion Grant effort;
- The AB 803 Adoption/Expansion program. . . empowered many teachers and administrators in schools and increased their control over the design and implementation of a program to incorporate technology in the school. In the context of policy-making and the creation of new legislation, we believe the process of good planning to be more important than increasing the number of computers in schools;
- Nevertheless, the low visibility, and the schools' inability or unwillingness to collect data to affirm what they say they see, continues to limit the public awareness of the Adoption/Expansion program and its impact.

Recommendations based on the study of programs and projects funded from 1984-1989

The following recommendations are based on practices and products developed under AB 803 that should be considered for continuation or adaptation in future planning for educational technology programs.

1. Continue to provide information to educators about how to access software, video, and other technology-based resources that are matched and integrated with the California Curriculum Frameworks.

2. The software and video clearinghouses should be expanded and closely linked with existing curriculum and staff development resources including the Subject Matter Projects, regional staff development agencies (SB 1882), County Offices of Education, the CTP, and post-secondary institutions across the state.

3. Provide for intensive curriculum-focused technology institutes with the involvement of the CTP, ITV agencies, Software Development Projects, Research and Development projects, and the Level I and Level II Model Technology School projects. Expand the institutes to include a pre-service component for new teachers and an in-service component for instructors in public post-secondary institutions.

4. Systematic and coordinated efforts should be made to develop exemplary instructional video and multi-media programs to serve local and state-wide needs such as educational programs related to California history, the State Curriculum Frameworks, exemplary uses of technology through video, case studies, and applications of research into instructional practice.

5. Consideration should be made for the carefully planned large scale purchase and distribution of equipment to schools if it is determined that such distributions are cost-effective and will significantly stimulate expanded utilization of technology to increase teaching and learning opportunities.

6. State licensing of instructional video programs (as well as appropriate video teleconferences) should be continued with greater involvement of subject matter specialists, ITV agencies, and media directors combined with ongoing assessment of the use and impact of programs on teaching and learning.

7. Funding and other incentives should continue for some form of "Research and Development Projects" to provide for the development and validation of new educational uses of technology in an effort to provide educators with up-to-date products and practices that can be cost-effectively adopted or adapted.

8. The success of the AB 803 dissemination programs in previous AB 803 adoptions as well as new uses of technology suggest that the wide spread dissemination of promising practices and products should be not only be continued but expanded beyond both the prior effort and current dissemination of model technology schools.

9. Site level grants for targeted technology use with special emphasis on school and classroom specific technology-based intervention plans, site-based staff development, curriculum integration, and emphasis on formative evaluation should be continued.

Appendix

- Summer Technology Institute Telephone Survey Findings
- Selected References

Summer Technology Institutes Telephone Interview Findings

Appendix A

Elementary, 1986 and 1987 (Two sessions per year)

A total of 16 educators who attended one of these four sessions were surveyed. Most (81%) were classroom teachers at that time, and three-quarters are currently in the classroom. Few of these teachers were new to the field – the number of years spent teaching ranged from six to 26, with the average being 15 years. Over two thirds have been mentor teachers, including some who have been mentors for several years. About one third have served as school technology coordinators. Only two teachers who had been promoted after attending the institute felt that attendance had had an influence on their promotion.

Teachers were asked to rate their district's support for technology use during 1990-91 and at the time of the institute. No significant differences in district support were reported over this time period. Several respondents stated that, due to budget problems, insufficient funding was available for technology support during 1990-91. The loss of Supplemental G rant funds deterred many districts from allowing their schools to apply for AB 1470 grants.

All teachers surveyed felt that attending the institute had a great a deal of positive impact on their teaching abilities. Several cited dramatic changes in how and what they taught, and all described a feeling of excitement about the material they were exposed to at the institute. Teachers cited improved technology integration skills, better understanding of the curriculum frameworks, and increased motivation to use technology and to apply for technology grants. One stated that the institute "provided power and knowledge that overcomes a lack of district support."

All but one stated that they had become involved in other technology-related activities after attending the institute. Almost all became very active in Computer-Using Educators (CUE) and the California Technology Project (CTP), and several have been providing training to other teachers, including two who teach college classes in educational technology.

All but one stated that the institute team had provided significant staff development and technical assistance to the district. A quarter of the teachers, however, felt that there was a lack of communication between the team members after they returned from the institute.

In general, teachers felt that the summer institute program was very effective and provided a reasonable return on the State's investment. The average overall rating was 4.8 on a scale of one to five. All but one stated that they would attend a future institute, if one were offered.

Middle School/Secondary Math-Science, 1986 and 1987 (Three sessions per year)

A total of 21 educators who attended one of these four sessions were surveyed. Most (81%) were classroom teachers at that time, and 85 percent are currently in the classroom. Few of these teachers were new to the field – the number of years spent teaching ranged from six to 36, with the average being 17 years. Half have been mentor teachers, including some who have been mentors for several years and almost half are math or science department heads. Two are school technology coordinators, two are principals, and three are district administrators. Four of the

educators (19%) felt that attending the institute had had some influence on their being promoted to a higher position.

Overall, district support for educational technology increased slightly between the time of the institute and the present. The only significant increase reported was in district support for the adoption of new technologies such as laserdiscs, CD-ROM, and camcorders.

All teachers surveyed stated that attending the institute had at least some positive impact on their teaching abilities, and most (86%) felt that there had been a great deal of impact. Most of these mentioned a change in attitude as being the most significant result – either a lessening of their fear of technology or an increase in confidence in their ability to use technology effectively. Several mentioned specific success stories, such as one person who went from being a regular classroom teacher to being voted "Teacher of the Year" and another who decided to get her M.A. in Educational Technology as a result of being inspired by the institute.

Many of the teachers (57%) stated that they had become much more involved in other technology-related activities after attending the institute. About half of the teachers surveyed are active in CUE, and several attend conferences sponsored by CUE and other organizations. One teacher beta-tests new programs for software companies, and several stated that they are involved in technology activities at the school or district level.

Seventy-one percent stated that the institute team had provided significant staff development and technical assistance to the district. Many felt that their districts had increased their commitment to educational technology. Some districts, for example, created new positions to oversee educational technology, and others provided in-service training on a district-wide basis. One teacher stated: "This school has become an example for others in the district."

In general, teachers felt that the summer institute program was very effective and provided a reasonable return on the State's investment. The average overall rating was 4.5 on a scale of one to five. All of the teachers stated that they would attend a future institute, if one were offered.

Secondary English-Language Arts, 1986

Seven educators who attended this sessions were surveyed. Most (86%) were classroom teachers at that time, and all are presently in the classroom. None of these teachers were new to the field – the number of years spent teaching ranged from seven to 32, with the average being 20 years. All have been mentor or resource teachers and almost 40 percent are English department heads. Only one is a school technology coordinator.

Overall, district support increased slightly between 1986 and 1991. The only significant increase reported was in district support for the creation of educational technology partnerships with business and industry.

All teachers surveyed stated that attending the institute had at least some positive impact on their teaching abilities, and over half felt that there had been a great deal of impact. Two teachers stated that they are using video much more effectively, and one of these wrote a course on video use for the entire district. Some of the others stated that they felt more comfortable using computers. One remarked that the institute "opened a lot of doors about what could be taught."

Four teachers (57%) stated that they had become more involved in other technology-related activities after attending the institute. Two, however, felt that the institute had not affected their

involvement. One teacher has been writing articles on technology and is currently working on a book.

Forty-three percent stated that the institute team had provided significant staff development and technical assistance to the district. Most stated that they did not function as a team after the institute, although some individual assistance was provided by the team members.

Overall, teachers felt that the summer institute program was a fairly cost-effective use of state funding. The average rating was 3.4 on a scale of one to five. All but one of the teachers stated that they would attend a future institute, if one were offered.

Secondary History-Social Science, 1986

Seven educators who attended this sessions were surveyed. Most (86%) were classroom teachers both at the time of the institute and currently. All of these teachers have been in the classroom for a number of years, ranging from 15 to 35, with the average being 23 years. Four have been mentor teachers, and one is a history department head. The only non-teacher surveyed is a district technology coordinator.

Overall, district support remained roughly the same between 1986 and 1991 – no significant increases were reported. One teacher stated that the loss of Supplemental Grant funding caused their district not to support AB 1470 grant applications.

Most teachers (83%) stated that attending the institute had a significant positive impact on their teaching styles. Teachers reported that the institute stimulated them to use a variety of technologies in their classrooms, including computers, ITV, video, and laserdiscs. One teacher stated "I was a complete computer illiterate; now I am the department expert." One teacher felt that the training had little impact because she was unable to get equipment and support from the principal.

All stated that they had become involved in other technology-related activities after attending the institute. Three belong to Computer-Using Educators (CUE), and one is involved in the California Technology Project (CTP). One teacher is writing his own software and publishes an educational technology newsletter, and another presented at the ICCE conference in Toronto.

Fifty-seven percent stated that the institute team had provided significant staff development and technical assistance to the district. Most stated that they did not function as a team after the institute, although some individual assistance was provided by the team members. Three stated that district support for the teams was insufficient.

Overall, teachers felt that the summer institute program was a cost-effective use of state funding. The average rating was 4.0 on a scale of one to five. All of the teachers stated that they would attend a future institute, if one were offered.

Secondary English-Language Arts/History-Social Science, 1987 (Three Sessions)

A total of 16 educators who attended these sessions were surveyed. Most (88%) were classroom teachers at that time, and the same number are presently in the classroom. Few of these teachers were new to the field – the number of years spent teaching ranged from five to 30, with the average being 16 years. Thirty-eight percent have been mentor or resource teachers, and 44

percent are English or history department heads. One is a school technology coordinator, one is a vice principal, and another is a district administrator.

Overall, district support remained roughly the same between 1986 and 1991 – no significant increases were reported.

All but one of the teachers surveyed stated that attending the institute had at least some positive impact on their teaching abilities, and 60 percent felt that there had been a great deal of impact. However, many felt that limited district support and poor access to technology kept them from realizing the full potential of what they learned at the institute. One of the most positive comments was: "Fantastic – 100 percent change – now I have internalized knowledge that I am doing the right things with the technologies." Another stated that it was the best staff development she had ever experienced.

All but one stated that they had become involved in other technology-related activities after attending the institute. Two belong to Computer-Using Educators (CUE), and two are involved in the California Technology Project (CTP). A few stated that they use computers at home, and a few use other technologies such as laserdiscs and telecommunications.

Less than half felt that the institute team had provided significant staff development and technical assistance to the district. Most stated that they did not function as a team after the institute, although individual assistance was provided by the team members. Several felt that district support was lacking, and a few stated that their teams were dissolved after the elimination of the Teacher Education and Computer (TECC) centers.

Overall, teachers felt that the summer institute program was a fairly cost-effective use of state funding. The average rating was 3.4 on a scale of one to five. All but one of the teachers stated that they would attend a future institute, if one were offered.

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